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ACHIEVE HEROIC RENDERS
PAGE 38

25 KEYSHOT TIPS & TRICKS
Experts teach you how to get the best out of the renderer

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“The materials that were used in this model were very simple with only a few variations among them, just to differentiate the plastic, metal, matte and glossy parts of the figure”

Daniel Bel on creating materials
Page 40

Render this superhero
Page 38

Daniel Bel
danielbel.com

Software ZBrush, 3ds Max, V-Ray, Photoshop

Welcome

To the magazine and 100 pages of amazing 3D

Welcome to **3D Artist**! Sci-fi renders are ten-a-penny, truth be told, and wherever you look there are new worlds and new horizons that you guys are creating in 3D. But how do you stand out from the crowd? Check out our feature on p30 to discover the secrets of sci-fi masterminds like Ben Erdt and Kurt Papstein, and find out how they produce work of such variety and quality.

Elsewhere in the mag we've spoken to an awesome collection of artists about their favourite tips and tricks for getting the most out of KeyShot, Daniel Bel teaches you how to achieve heroic renders (like the cover), we've got an awesome mech wolf courtesy of 3ds Max pro Dmitriy Rabochiy, Damon Woods returns with a cool cyberpunk concept, the guys from iMakr show you how to model and 3D print Thorn from *Destiny*, Pablo Castaño talks gears and wires and Stefano Tsai reveals how to create comic book style renders, all in easy to follow step-by-step guides.

Don't forget, our incredible BFX competition is still running, so be sure to check it out in The Hub – you could win an enormous selection of awesome prizes! Get your renders in before 14 October and you could be walking away with MODO, MARI, Houdini, V-Ray, Realflow and more. Silly not to, right? Enjoy the issue.

Steve Holmes, Deputy Editor

Sign up, share your art and chat to other artists at **www.3dartistonline.com**

Get in touch... 3dartist@imagine-publishing.co.uk @3DArtist Facebook.com/3DArtistMagazine

3DArtist

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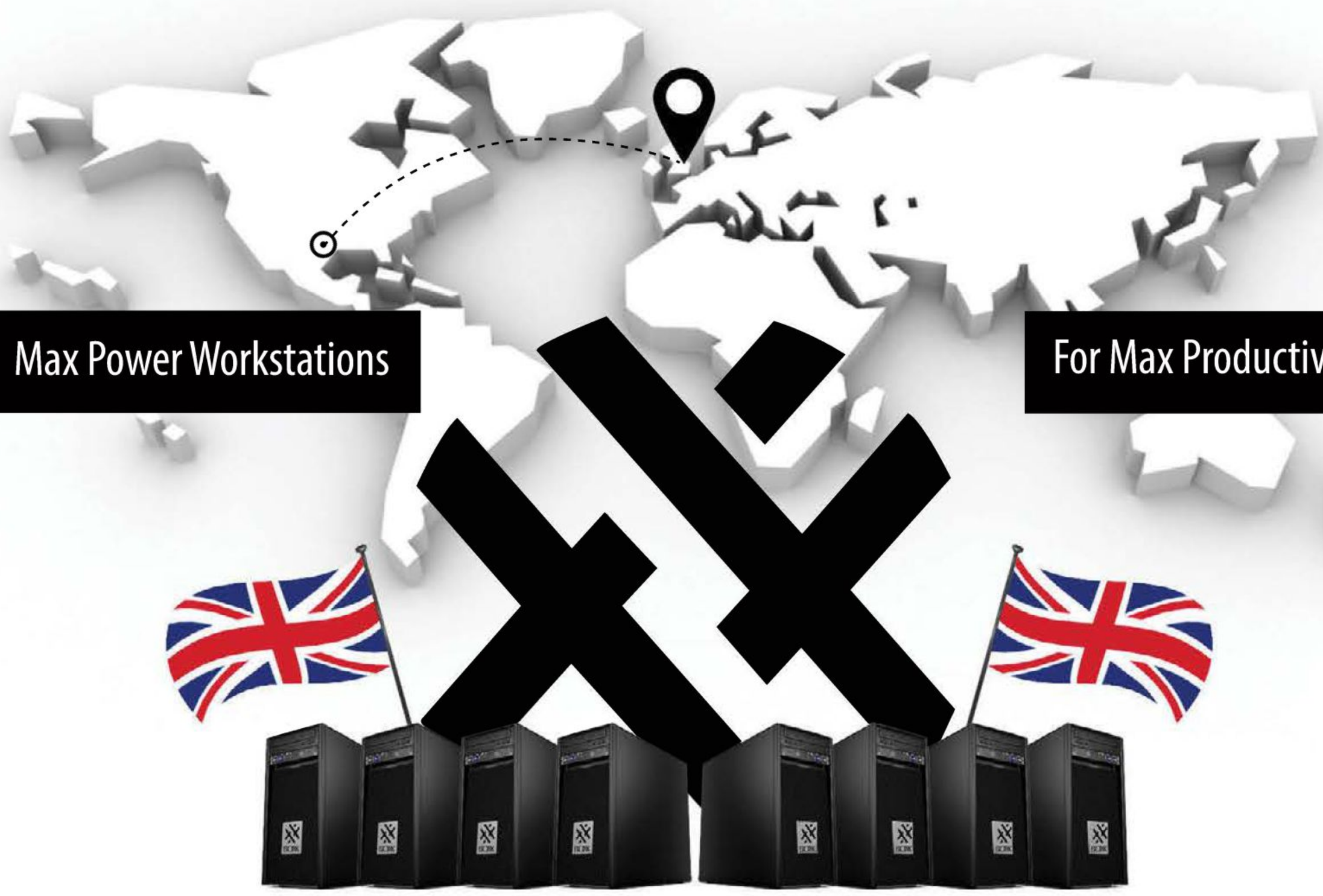

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The Expert Panel

This issue's team of pro artists...

DANIEL BEL
danielbel.com

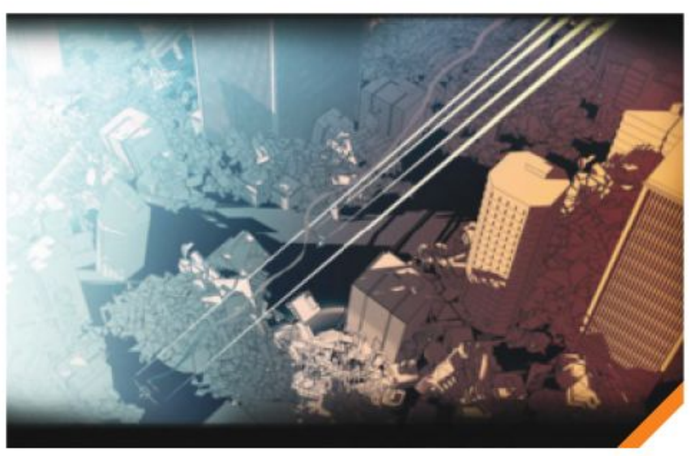
Daniel is undoubtedly a world-class sculptor, but this time out he's here to teach you how to create heroic renders of your own, much like his brilliant cover piece. Check it out on p38.
3DArtist username danielbel

DMITRIY RABOCHIY
art-grizzly.tumblr.com

We went to Dmitriy with a concept for a mech wolf a few months ago, which he promptly adapted and made 100 times better. Discover how to create a unique, detailed mech of your own on p42.
3DArtist username n/a

DAMON WOODS
dkwoods.com

We've enlisted Damon's exceptional character talents again this month. We sent him away with a cyberpunk brief and he came back with a superb tutorial and another stunning render.
3DArtist username dkwoods



STEFANO TSAI
stefanotsai.com

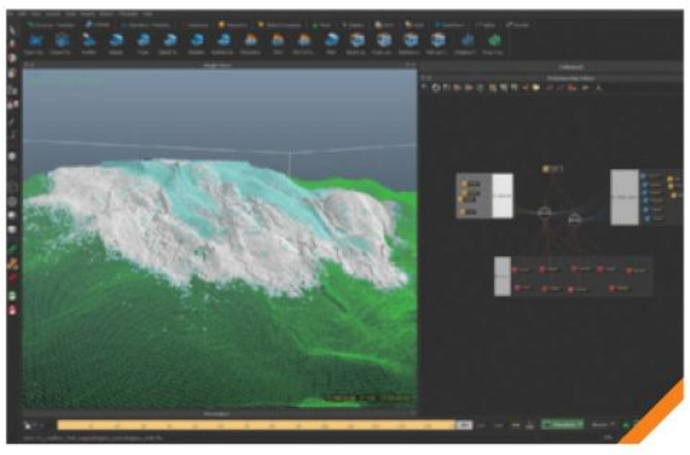
Some of you will be surprised to know that creating comic book style renders is entirely possible using 3D models. Stefano has taken time out from his graphic novel to show you the ropes.
3DArtist username StefanoTsai

KIRBY DOWNEY
imakr.com

We'd wager that more than a few of you are fans of *Destiny*, so head to p66 to discover how the clever guys at iMakr re-created an iconic handgun from the game and then 3D printed it.
3DArtist username n/a

PABLO CASTAÑO
facebook.com/eletecedateando

Gears and wires, gears and wires. Pablo is amazing at the nitty gritty details that go into creating strong conceptual sci-fi images. Head over to p74 to pick up a few techniques to practise.
3DArtist username Ltcdata



MATTEO MIGLIORINI
art2upz.com

RealFlow is recognised as being one of the most interesting tools on the market, but how does the latest release fare? Make your way to p78 to find out from RealFlow expert, Matteo.
3DArtist username n/a

POZ WATSON
uk.linkedin.com/pub/poz-watson/61/4a3/506

We sent Poz off on a merry quest to the far corners of the galaxy to track down some of the most prolific and fascinating sci-fi aficionados out there. Luckily for her, there are plenty of them on Earth.
3DArtist username n/a

ORESTIS BASTOUNIS
twitter.com/mrbastounis

Orestis reviews about 4 million things a month so we're lucky to have him on board to put a Workstation Specialists mobile workstation through its paces this month. Check it out on p76.
3DArtist username n/a

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/chillblast @chillblast

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Sci-fi: from concept to render
"[It's] all about mixing the ingredients, looking outside the genre and making something unique"
Kurt Papstein on balancing ideas in sci-fi Page 30
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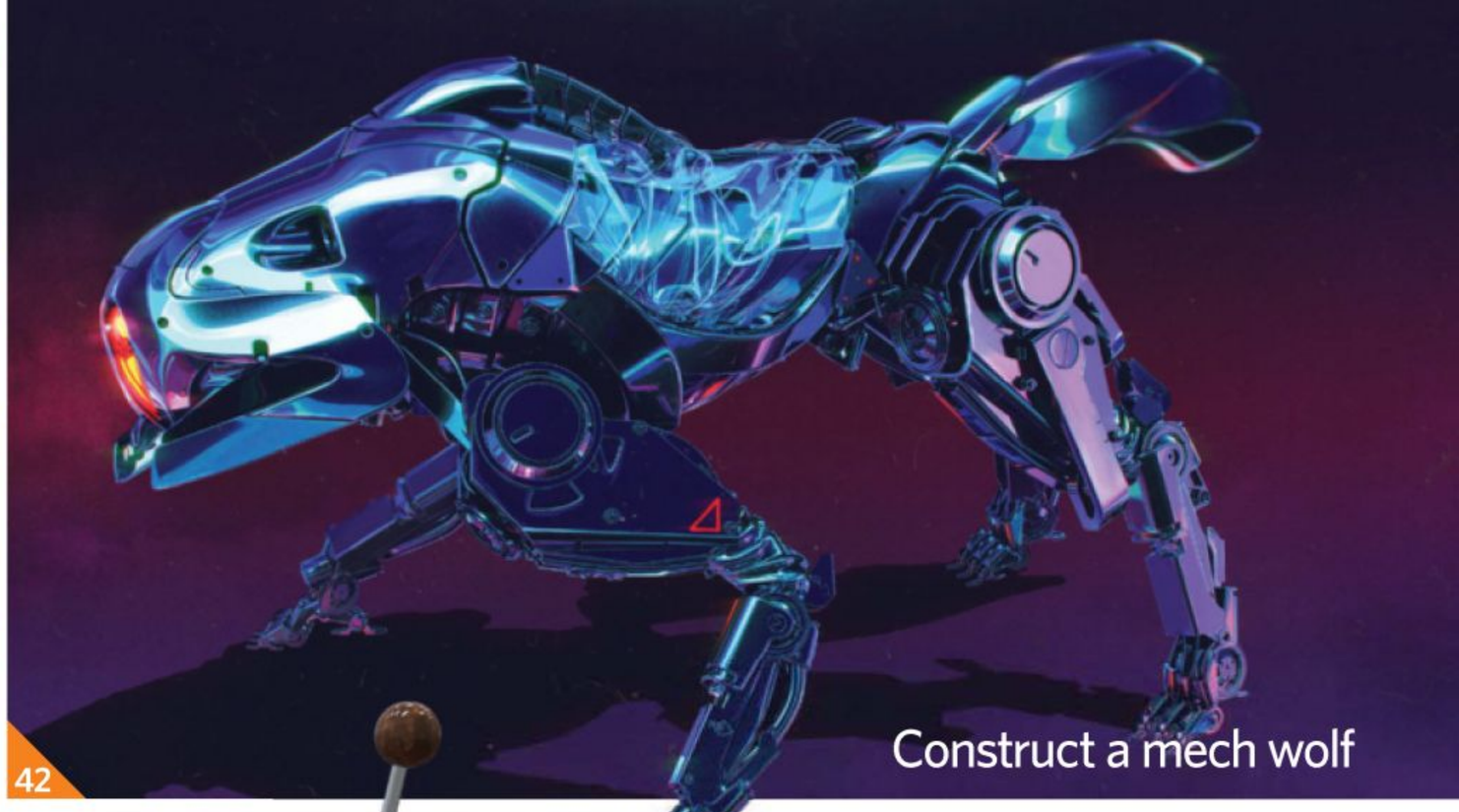
MAYBE THAT'S WHY THEY STOPPED CALLING IT TAIPEI AND STARTED REFERRING TO IT AS THE OUTER ZONE - STRIP A PLACE OF ITS NAME AND IT TAKES AWAY ALL THE MEMORIES.

Create comic book style renders

50



Construct a mech wolf

42

"From what I've seen, the animation and scripting combination is phenomenally powerful"

Simon Williamson on KeyShot 6's Material Graph **Page 24**

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Render a superhero

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The Gallery

Have an image you feel passionate about? Get your artwork featured in these pages
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Reynante M Martinez

reynantemartinez.com

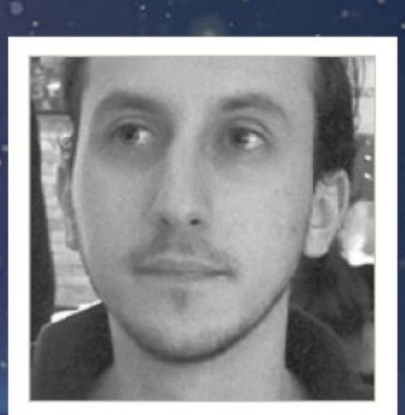
3D Artist Online username:
reynantem

Software Blender, Cycles

Work in progress...

“This was inspired by our search for happiness and belonging, and how we go about our lives as mere spectators of time. I wanted to portray the feeling of being alone and social at the same time, and how the mix of emotions creates a complex network”

Reynante M Martinez, *Tree of Life,* 2015



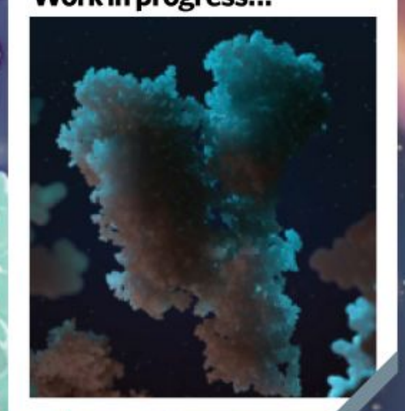
Hugo Bodoukian Meyrant

hugobm.com

3DArtistOnline username:
HugoBM

Software 3ds Max, V-Ray, Fusion

Work in progress...



“I modelled protein shapes (with FROST) in various colours (red for love, blue for intelligence, green for creativity). Big-scale subsurface scattering was important for lighting and a good colour gradient”

Hugo Bodoukian Meyrant, *Intelligence's Protein,* 2015

Pablo Muñoz Gómez
pablander.com

3DArtistOnline username:
Pablander

Software ZBrush, Photoshop

Work in progress...

> As I was testing some settings in FiberMesh, I made something that, unintentionally, looked a lot like a Russian hat (ushanka). I dropped what I was originally working on and continued to design this new character

Pablo Munoz Gomez, *Ushanka,* 2015

Elena Valeria Nedelcu

behance.net/elenaen

3DArtistOnline username: evalery

Elena comes from a fine art background and is now addicted to creating 3D

Software 3ds Max, ZBrush, V-Ray, Photoshop, After Effects

Work in progress...

> "I wanted to create a combination of photorealism and fantasy with things I enjoy. I went for a natural look for the interior to contrast with the sci-fi backdrop and ZBrush helped to achieve realism for the food-related items and latte froth"
>
> **Elena Valeria Nedelcu,** *Early Breakfast,* 2015

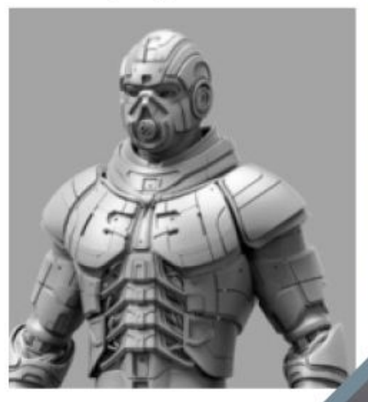
Rafael Gomes Amarante

rafaelamarante

A concept/3D artist, Rafael is focused on hard surfaces and sci-fi for games and cinematics

Software Cinema 4D, ZBrush, KeyShot, Photoshop

Work in progress...



> This is a personal piece of work that has been realised to help me improve my techniques and put in a concept that I had in mind for some time into practice

Rafael Gomes Amarante, *R4*, 2014

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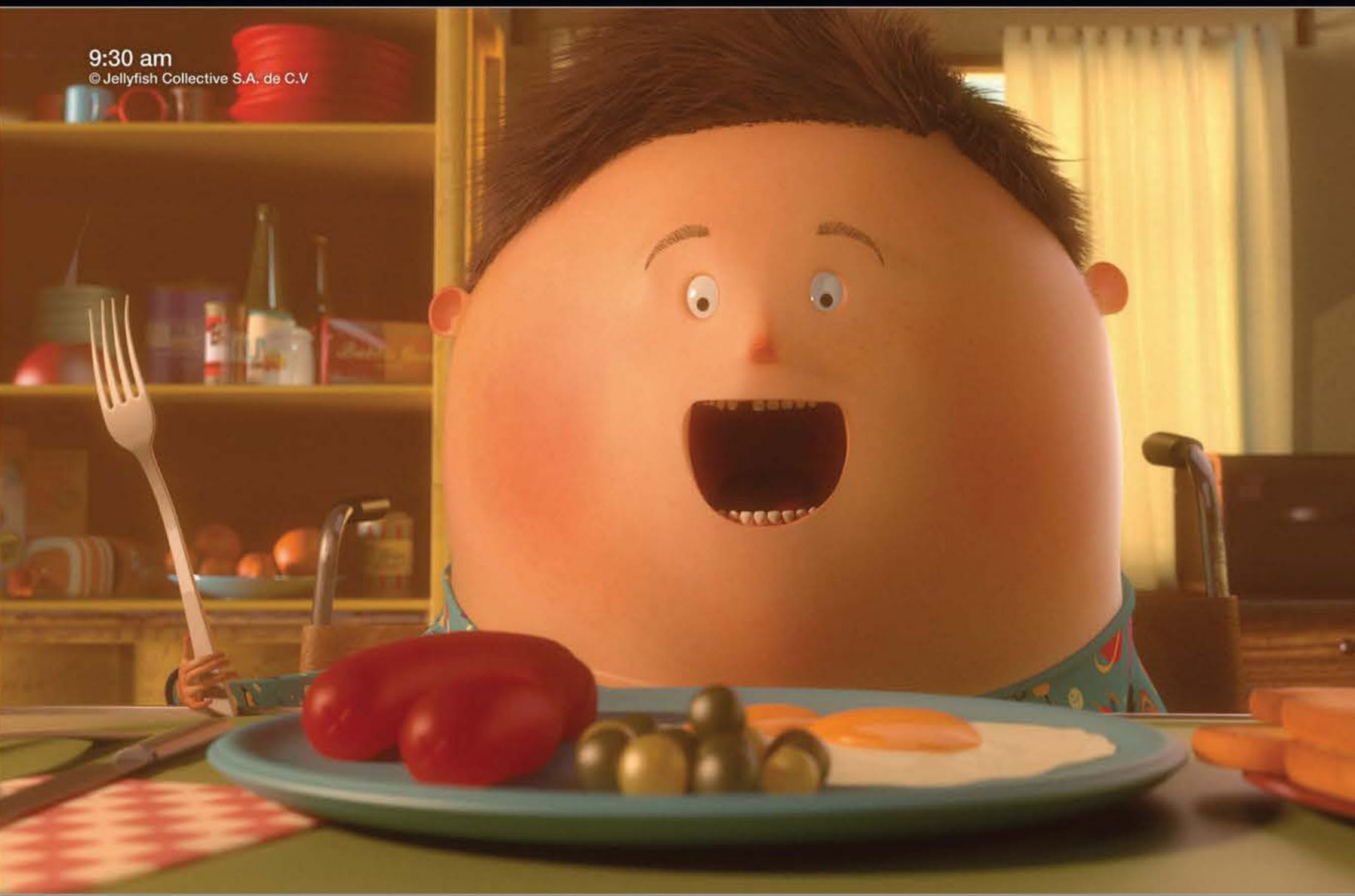

“9:30 am”

created by Alfonso de la Cruz

“9:30 am” is an elegantly told story of a small boy having his breakfast, brought to him by the unseen (except for her hand) woman he lives with, at 9:30 am, and the dreams and ideas that come to him in the process.

“I was raised by my great grandmother and almost everything that happens in the short film happened to me in real life. Being raised in that way helped me to understand life in a special way. I wrote the story at night over about two weeks and almost at the same time I made a rough storyboard. 9:30 in the morning is the time when I used to have breakfast with my great grandmother.”

“Our render process was extremely easy and practical with RebusFarm. The RebusFarm system is literally like magic. Render times were different on every shot, but usually once I submitted a shot, it took from around 10 minutes to an hour to be ready on RebusFarm. Render times in the studio machines were around 2 to 3 hours per frame.”

Read the whole interview on our blog:
https://rebusfarm.net/9-30-am

Walfrido Ozanan Leite Campos Monteiro

walfridomonteiro.com

Walfrido is a visual artist living in Brazil who fell in love with game concept art as a teen

Software Maya, ZBrush, V-Ray, Photoshop

Work in progress...

“Bring back your head, that’s the briefing I got from the art director. I had to build three images with three different characters. The characters’ heads should be inside a weird headache world while their bodies would be in a more common activity”

Walfrido Ozanan Leite Campos Monteiro, *Bring back your head,* 2014

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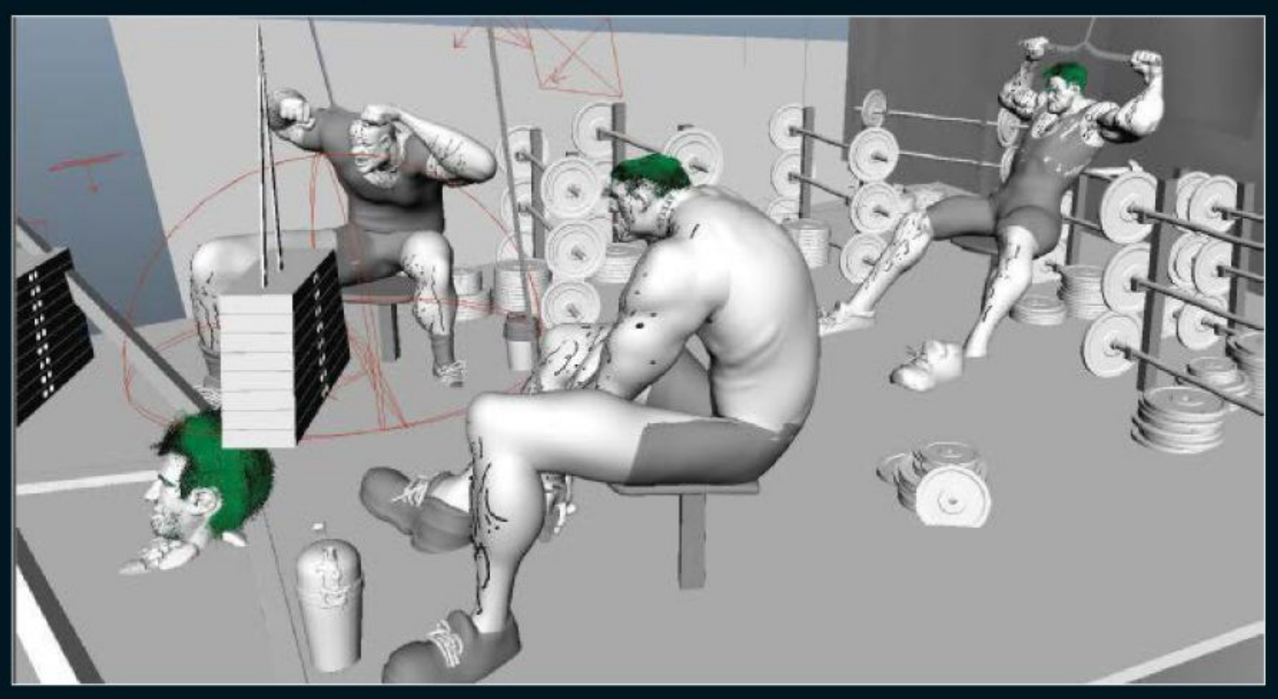
AT 8.00

> The first image was made twice, the upper part had to be rebuilt from scratch – created in ZBrush and Maya. I used DynaMesh and GoZ to send the models back and forth

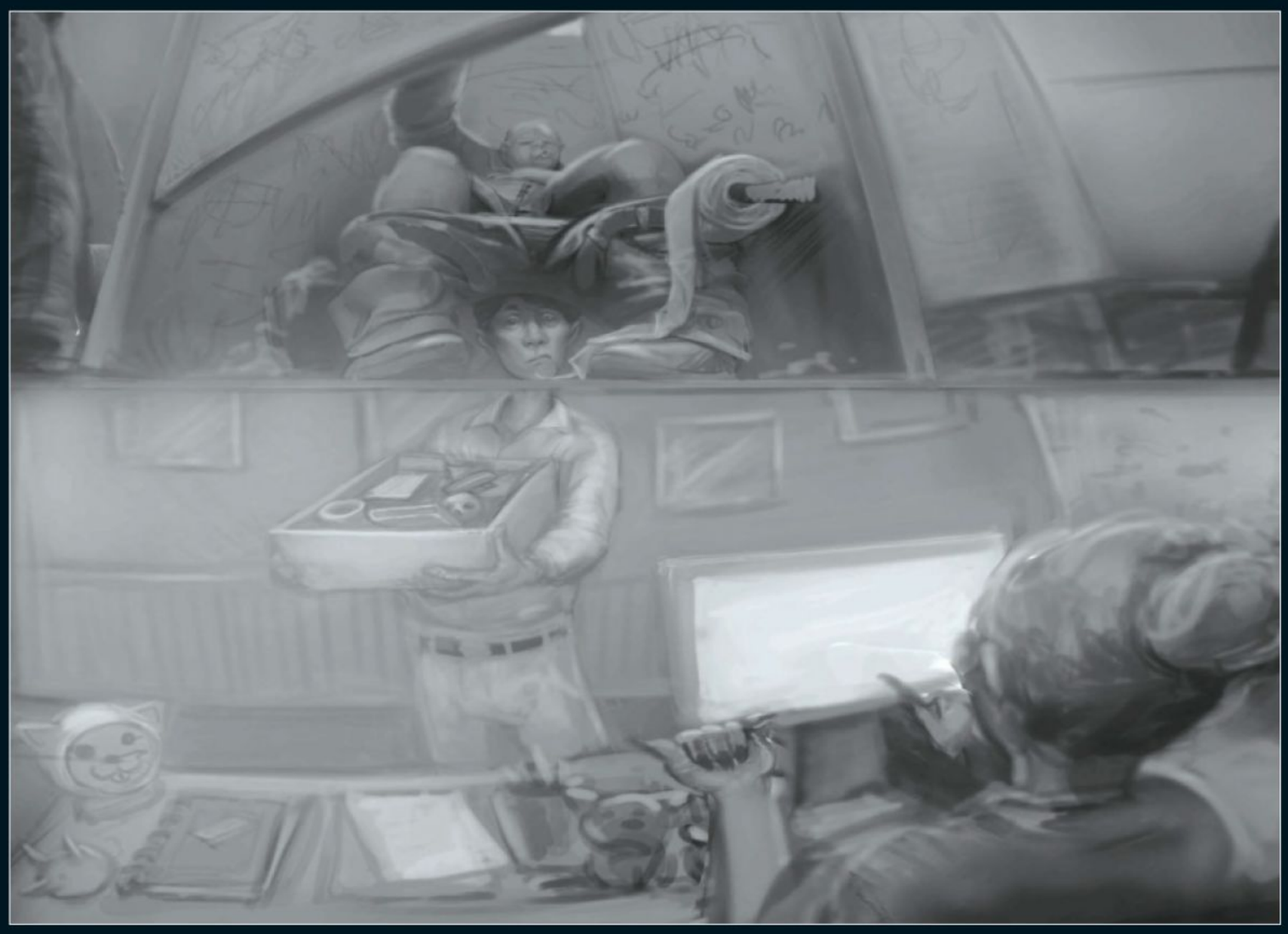
Walfrido Ozanan Leite Campos Monteiro,
Bring back your head, 2014

DISTORTED MODELS AND ODD PERSPECTIVE
ABOVE AND BELOW Modelling just for the view allowed me to keep the models inside the canvas and brought a good expression for the image as it added a cartoon feeling to it.

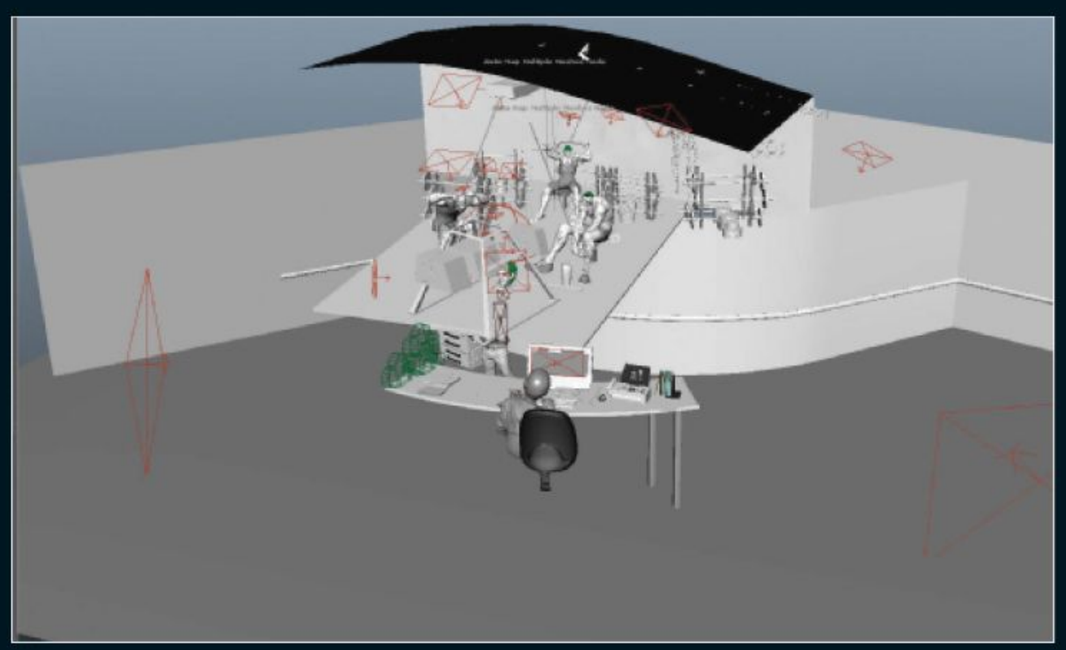


LIGHTING
LEFT I kept it very simple for the lower part of the image, a window light on the left side makes a bright spot on the side of the box adding force to the action line formed by the box perspective and the arms, leading action to the head.

ACTION LINES
LEFT The division of the two scenes had to happen naturally, so the fitness station works as the element that unifies the upper and lower parts of the image. The lines of it pull the action to the upper part of the image and the weight sends it back to the lower part.



CONTRAST AND LIGHTING
BELOW For the upper part I wanted a high contrast look, using Maya light linking to control everything, the brighter spots from behind the weights drives the attention from the background characters and leads the eye to any brighter spots in the scene.



POSITIONING
BELOW The central point of the image is the head that is in the middle of two different worlds but each world has its lines flowing in the head direction. I tried different positions for the scene elements until I had it the way i wanted.

25

TIPS AND TRICKS FOR USING

KeyShot

Digital artists reveal a treasure-trove of tips and tricks to apply when using KeyShot rendering and animation software

Globally recognised for its ease of use and fast rendering, KeyShot has now arrived at its sixth release. KeyShot offers users modelling, camera positioning and lighting tools to work with.

To find out more about just what makes KeyShot a dynamic, one-stop shop for your visual design and animation needs, we asked a number of digital artists and creatives who regularly use KeyShot to share some of their tips and their tricks, their secrets and their words of wisdom for you to apply to your own projects. Speaking about this aspect of the software, Peter Gill has the following advice to newcomers: "Do the tutorials: it only takes a day or two and then just have fun. Connect with your inner child. It's ideal to get visuals and renderings to look photorealistic; it's fast and you do not have to worry about asset management. This is great for a single artist who hasn't had any experience working in a team creating CGI imagery or motion."

EXPERTS

Will Gibbons
willgibbonsdesign.com
Freelance product design consultant

Bill Gould
gouldstudios.com
3D artist

Ara Kermanikian
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Triwa Falken Wrist Watch by Esben Oxholm

The big picture

01 **A rich digital feast** In my view, Luxion has developed a product that entices the user to play, experiment, test, and master every feature. Certainly, the Material Graph feature is a powerful technical tool. From what I've seen, the animation and scripting combination is phenomenally powerful. *Simon Williamson*

02 **Compositing elements** Anyone doing entertainment design will want to access the Material Graph Editor. An engineer or designer will certainly want access to the Geometry Editor. Anyone who does lots of compositing and postediting will want access to the multilayer PSD render output. *Will Gibbons*

03 **Using the Occlusion procedural shader** The Occlusion procedural in KeyShot 6 enables the user to add an ambient occlusion effect on a per-material basis. It is an ambient light-based shader that provides soft shadows and surface details based on surface proximity. It can be used alone or it can be used in conjunction with the Material Graph to create interesting effects based on occluded/unoccluded areas of geometry driven by textures. *John Seymour*

04 **Fundamentals of aesthetics** Use photorealistic images in internal design reviews to communicate design concepts better. You can even generate high-quality images for technical publications before there is a real product to photograph. Instead of a sheaf of drawings, anyone with a tablet, smartphone or PC can create the virtual component on the screen, instantly grasping aesthetic, ergonomic or manufacturing issues that may occur. *Paul Suttle*

05 **Fundamentals of process** It's very important to set the model hierarchy properly in the modelling application that the artist is using. *Abed Sabeh*

06 **Combining elements** I use a mix of photos, renders, 3D models and so on to create my outer space background the way I like it. After that I flatten the image, copy it and make a new 32-bit blank Photoshop image that I paste my space background in. I save it as an HDRI and then bring that in as a lighting option into KeyShot and then do the same with an 8-bit space image as a background. I apply the HDRI as the lighting but I use the 8-bit image as the background so I can adjust the lighting the way I want by making it brighter, rotating it a little and more, but I still have the background image look as I planned it in Photoshop. *Gurmukh Bhasin*

This image emphasises KeyShot's capacity to handle details and realistically capture the illusion of light and shadow

Bottom left: Subtle shading and detail in this character showcases how KeyShot allows artists to combine occluded and unoccluded areas

Bottom middle: Light-splitting work brings delicacy and accuracy to an image when using the updated Gem Material feature in KeyShot 6

Bottom right: TIP 11

Textures, shading and lighting

07 Range of tools Importing geometry ready for rendering is so easy with KeyShot. It supports the most widely used formats from both worlds of modelling including polygons or NURBs and even 3DM. The render engine that KeyShot uses also handles mixed geometry so you can have a scene that is made up of tessellated NURBs surfaces, render meshes or polygon data. So you can mix a scene that has geometry from Solidworks, Maya, Rhino3D and OBJs thrown in and KeyShot will handle this. *Martin Spencer Ford*

08 Surface visualisation Surface visualisation is the most important aspect of using KeyShot whether for the product or for an industrial designer. *Bill Gould*

09 Updated Gem Material For KeyShot 6, the Gem Material type has been overhauled, allowing for much more accurate representations of real-world precious stones such as diamond, ruby, emerald and so on. A new sampling technique has been used to achieve a better dispersion of light within the gem itself. Try lowering the Abbe value to below eight to achieve some beautiful light-splitting effects. *John Seymour*

10 Lighting If you have the time for it, you should really make use of the HDRI Editor to finely adjust your lighting for a specific purpose of a specific object at a specific angle and composition. Using custom lighting is the key to making really great renders. *Will Gibbons*

11 Adjusting backplates Backplates still need to be tweaked in an app like Photoshop, but you can do so on the fly. All you have to do is simply refresh the backplate library and drop in the adjusted backplate. The Perspective Match capability is not new to KeyShot 6, but it's very helpful and enables you to quickly match your model to the backplate. *Bill Gould*

12 Use your tools in sync with each other When you are having trouble in getting a material to look right, your problem is often the lighting, especially if you are working with highly reflective materials. Remember to work with the lighting in unison with the material. Don't just settle for the standard environment. Always use the built-in HDRI Editor if you have the Pro version. The lighting has a huge impact on the look and feel of the materials. You get the best results by adjusting them simultaneously – it's like a dance. Also, learn how to do some simple postprocessing and get used to having a good workflow between KeyShot and any image editing software. *Esben Oxholm*

13 Textures and layers Make sure that your model is well constructed and structured in a series of defined layers. In combination, use a material-based system to connect/link materials once in KeyShot. One more tip: in terms of a product model, make sure that you use radius, even if minute, in every corner. In terms of realism, the result is extreme. You will need a highlight on every edge. *Simon Williamson*

14 Testing lighting I usually like to create lighting setups that complement my designs and 3D geometry. It is important for me to figure out the lighting I like before applying materials. They way I test out lighting is to drag and drop different environment lighting options in and see which one looks the best to me. Once that is settled, I then start adding materials and adjust my materials to look good in the light that I chose. *Gurmukh Bhasin*

15 Lighting and camera position choices Make use of the fact that you can try out dozens of environments and tweak them in real-time and keep it loose rather than getting into making your own environments or overworking one. Give in to the more playful, discovery-based flow that KeyShot embodies. *Michael Trompert*

16 Placing and lighting a subject Plenty of HDRs come with KeyShot, and there's more on KeyShot Cloud. You can use the built-in Sun & Sky system to place your model anywhere in the world at any time. Any object, in addition to some standard ones, can be made into emissive lights to create specific lighting conditions. *Ara Kermanikian*

17 Roughness mapping This will enable a surface's reflection roughness/glossiness to be controlled/driven by a texture map, thereby allowing extremely complex surface reflections: anything from tarnished metals to water puddles, and anything else in-between. For even more complex surface roughness, try mixing two maps together using a Colour Composite node in the Graph Editor. *John Seymour*

Animation, live linking and refining images

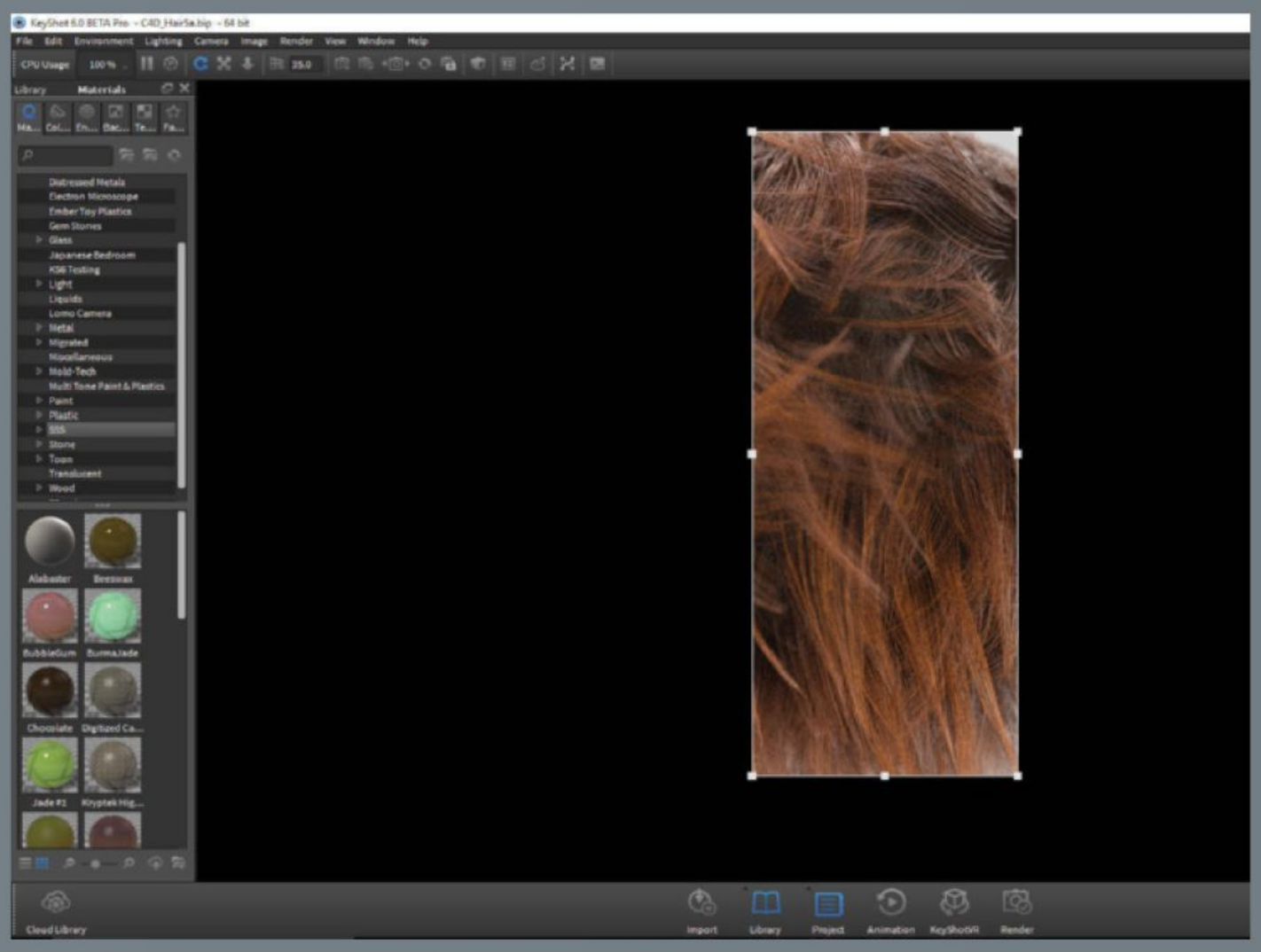
18 Combining material I rarely create still shots in KeyShot, I mainly use it to render out animations I've created in C4D so the new Python scripting features in KeyShot 6 are the updates I like most. By using a script, a user can import an OBJ Seq or an Alembic file frame by frame to be rendered inside of KeyShot, the timeline can also be controlled via script meaning cam/material animations and fades can be combined with your imported sequence. *Peter Gill*

19 Updating models with Live Linking This facility enables seamless model updates between the modelling software and KeyShot, without having to reassign materials, set up animations again or update settings. Transfer your design from PTC Creo, Solidworks or Rhino3D to KeyShot. Assign materials and animations, continue modelling and push over changes to KeyShot. Changed parts will be replaced and updated with the new parts, and all materials and animations will be maintained. *Paul Suttle*

20 Testing looks with Live Linking Live Linking lets you update your model within an existing KeyShot scene, directly from your CAD software. This way you avoid having to set up the scene from the beginning every time you (or your nit-picking boss) need some changes to the 3D model. In addition, you can start testing the look of of things like materials, colours and lighting before you are done with your design. *Will Gibbons*

Tip 20

Tip 20

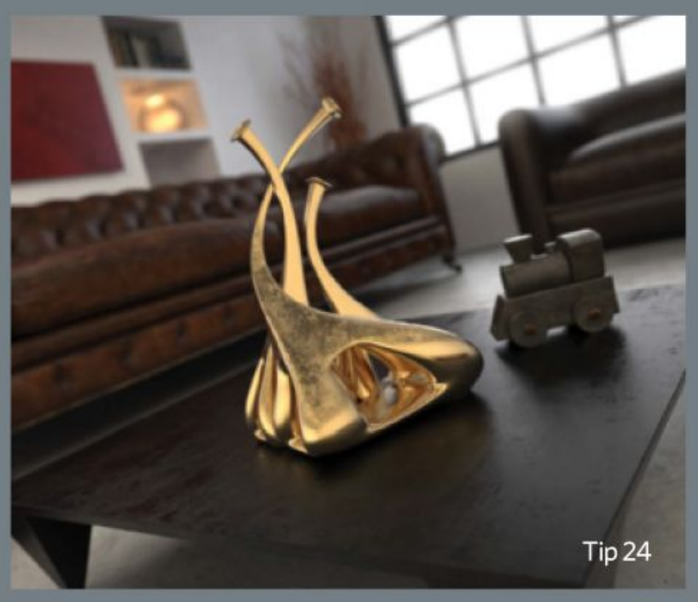

With the Realtime Render Region, workflow is maximised as you focus on a specific part of a given image

21 Importing 3D models Make sure you inspect it well and subdivide it so it's really smooth. Although live linking is there, you want to avoid having to reimport a model that has a different number of parts now or has had to be subdivided because you saw that it's too coarse-looking once you pulled that print resolution render. KeyShot is really good at handling lots of detail and millions of polygons, so I prefer to bring in highly detailed and smoothened models right at the beginning. *Michael Tompert*

22 Realtime region render This is a wonderfully useful feature for concentrating on certain areas of your image whilst rendering in the Realtime window. A marquee can be dragged out and positioned, and only elements beneath the bounding box will be rendered. All cores available (if set to all) will then be available for that region render, drastically increasing workflow when working with complex material, translucency, hair and so on. *John Seymour*

23 Refining your image It is extremely useful to send models into KeyShot during the idea creation and rough sketch stages of concept development because you can get a good idea of how things will look in the final render. Use the Material Graph function to further fine-tune and perfect the materials to have a more unique look. *Ara Kermanikian*

24 Internal rendering mode This mode is designed to be used in enclosed/semi-enclosed spaces that are usually difficult to light and where indirect illumination is required. Try using this lighting mode in conjunction with area lights, emitters and IES lights to achieve different scenarios and looks. *John Seymour*


Tip 24

25 Labels and motion blur I love the newly integrated ability to have a label/decal take on the same aspects as the material that it is placed on. The motion blur feature (integrated with the animation mode) adds spectacular results as does animating with depth of field. The updated Move tool has been refined beautifully, and the real-time regional rendering is a great time saver for complex visualisations. *Simon Williamson* ■

Taking creative control

The new Move tool makes positioning your geometry much easier than before. KeyShot 6 speeds up the artist/designer's workflow and allows you to do more in KS and less post-editing. ***Will Gibbons***

KeyShot uses unique rendering technology which makes it possible to see all changes to materials, lighting, and cameras instantly. ***Paul Suttle***

The real-time region render lets you select the defined area of your overall image and it will res up way faster than if it would have to res up the entire image. ***Esben Oxholm***

KeyShot is the only software, that I've encountered so far, that allows engineers to take part in a more high-end CGI process, which traditionally has been outsourced to third-party companies specialised in visualisation. ***Magnus Skogsfjord***

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Technique focus

Incredible 3D artists take us behind their artwork

CONCEPT I wanted to create something delicate and aggressive at the same time, so I chose a little ladybird which is always a cute and fragile life. Then I gave it some weapons such as an armoured shell and big sharp blades to make it a kind of mech/biological tough bug. This has turned it from a cute bug into a dangerous bad bug.

Renato Theity Suetake
renatosuetake.wix.com/port

Renato is a graphic designer who has been working with 3D images since 2008

Software 3ds Max, V-Ray, Photoshop

Bad Bug, 2014

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SCI-FI FROM CONCEPT TO RENDER

Learn the secrets to creating renders that are out of this world from the greatest artists in the genre

Science fiction throws up challenges like no other genre, and it's arguably one of the most popular areas of CG in the world thanks to special effects leading the way across blockbuster films and triple-A videogames. "Sci-fi is a huge opportunity to really try something new," says Francesco Corvino, "if the story is set today or in the past, you always keep going back to an established set of references and your designs unavoidably take an 'already seen' look. However, when it comes to sci-fi, if you keep your ideas fresh and you don't lose yourself in the usual vocabulary, then you can really invent a new language."

It's the "vast range of tech, tone and mood," that makes sci-fi appeal to Kurt Papstein too. "The shapes in science fiction can be as out there as you want, bordering on ridiculous. It's a fantastic genre to explore creatures and the natural world on other planets." One of sci-fi's great strengths is that the stakes are naturally high, the frontiers automatically dangerous, the worlds always ripe for exploration. It's a space in which any story – from *Gravity* to *Guardians Of The Galaxy* to *Edge Of Tomorrow* – can play out. And the great thing about working in sci-fi is the high level of creativity it demands at every stage of the pipeline. From the concept artists designing creatures or spaceships, to the modellers making those environments feel both real and fresh, to the postproduction team and the matte painters adding the details that tie everything together: sci-fi is filled with possibility.

One of the risks, according to the Doni brothers, Davide and Mario, is actually working too hard to avoid clichés. You have to "find the right balance between something the audience could interpret and something new. A thing we really like to do is to mix sci-fi technology with some kind of ancient technology." Papstein agrees that we'll always be interested in an alien take on humanity, but says that it's "all about mixing the ingredients, looking outside the genre and making something unique."

Ambient occlusion pass of Space Marine Patrol Squad by Davide and Mario Doni

Contributors

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Kurt Papstein
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Stefano Tsai
Concept/environment artist
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Concept art

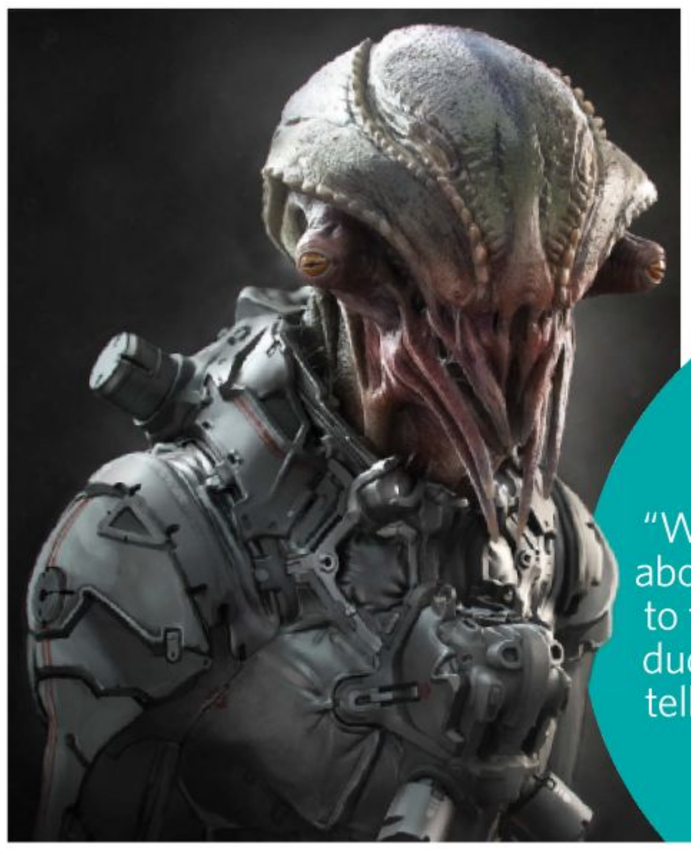
Inspiration, research and perseverance are the pillars that great concept art is founded on

There's nowhere a concept artist is more in demand than on a sci-fi (or maybe fantasy) film. Even if the story comes from a source novel where the characters have been well-thought-out and described, even if the script nails a fresh and innovative world just bursting to be brought to life, there is still loads to do. There are creatures, robots, spaceships, humanoid aliens, planets and environments to be designed, not to mention a look and feel of the piece to be conveyed.

"Usually I put my reference images and books around me and just start drawing or sculpting without constraining myself too much to a certain target look," says Ben Erdt. "Once the design starts to go in an interesting direction, I start to make more specific decisions. However I try not to get too attached to the design as it still should be open for changes. If the design starts to remind me too much of an existing one, I modify it to make it look more distinct. Looking at animals helps me there most of the time." Alex Figini likes to use the natural world too, noting that if you "reference work in the sci-fi genre too heavily, essentially it's been done already and that gets cannibalistic."

Some concept artists will specialise in particular types of work. Papstein, for instance, is much in demand for his creatures. "I'm told 'just do your thing,'" he explains, "so I feel pretty lucky." He finds areas like intricate mechanical modelling much harder, adding that when "talent like Vitaly Bulgarov comes along, it makes it hard for the rest of us. The thing is, when someone like that comes along, it's the new normal."

And Simon Blanc, who specialises in lighting and shading, credits concept artists with being the ones who are making sci-fi really shine. "I see so much amazing art being created," he says, "[for example] incredible universes with a lot of thinking behind them, new types of transportation, new energies, humans integrated in a global space culture... I feel like there's a new way to think about the future, it's not just the classic human empire in space, it's about time we rethink the old militaristic approach to everything!"



Have a story to tell

"When creating characters, think about what could add more depth to the design. If the finished alien dude is not only a nice model but tells a little story, that makes him more interesting to look at"

Ben Erdt

The inner workings of a concept artist

Kurt Papstein reveals how he fits into the pipeline, and the differences between working in film and games

"If I'm working on a film project, I typically work directly with the director and visual FX coordinator... When I'm in games, I work with the art director, creative director, marketing, the animators, the game designers, the engineers, the VFX artist, the sound designers... Pretty much the entire team. There are so many connections and technical hurdles in games that you need to be mindful of and to make sure everything lines up. With movies it's just assumed the next group of talent down the line can make whatever you designed work visually. Most of my concepts start with pen and ink, paper and pencil, or sometimes I'll work digitally in something like Photoshop or Sketchbook Pro. Movie directors love to see the concept in the round [and 3D prints of] the design and so on. So I work in ZBrush and spend much of my time early on making rough maquettes, then later doing a posed final sculpt based off the feedback. I will render the model in passes and composite for a clear representation of the final shot."

Think beyond the possible

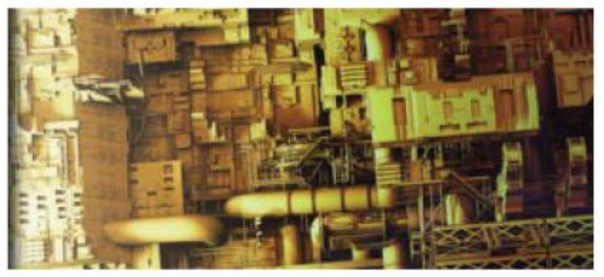
"It is not always necessary to make things functional. We have the freedom of science on our side, which is really the same as magic if you think about it. Push shapes, question what we are familiar with"

Kurt Papstein

Francesco Corvino believes that you need to look outside standard sci-fi inspirations to create unique art

Develop a feel for your world

Stefano Tsai explains how he established the look of sci-fi comic BPI: Blue Patrol Industrial



01 **Build a solid base** For this comic, 3ds Max, V-Ray and Photoshop has been used. First, build your model on solid bases, because no matter now crazy it is going to be, it has to make sense. If you want to build up an extremely huge structure then – even if we may have superstrong and light materials in the future – you can't give it unrealistic thin pillars, because this won't work.

02 **The devil is in the details** Now add good lighting, colours and dirt to bring it to life. No matter how different the shape is to what we are used to, as soon you use a typical lighting method it feels like it exists on Earth. For example, the warm yellow colour will mean the Sun. Maybe you have set your sci-fi world far away from Earth, so the solar system is not the same any more. However, the same lighting settings provide a good human touch right away. This is the same with dirt, which can mean ageing and history between human, props and environments."

03 **Add evidence** To give the image more cultural depth you can apply some more human details, and this could be art, signs of human living or graffiti. Here, some graffiti has been added, and this is the final touch of the image to show who is living here and how it's all going, which brings in some more background story information.

Arresting armour

Ben Erdt discusses the modelling challenges of convincing armour

"I think one of the challenges in modelling for sci-fi projects can be making the armour of sci-fi characters functional. There are often issues like, for instance, an upper body packed in hard plating that won't allow the character to either twist or bend his body, or massive shoulder pads which block arm movement or instead intersect with the head. Also necks embedded in padding, plates, structures and pipes make it very difficult to move the character's head around. These issues can force the artist to invest a lot of time in tweaking and fixing the model. I remember in 2008 I was working on a character that could not move his head down because the helmet was colliding with his chest armour. I had to go back to the high poly, fix the problem and adjust the low-poly model accordingly. I prefer building the armour on top of a rigged version of the character's body as it can make spotting articulation issues easier as you are able to do constant mobility tests."

Sci-fi movie concepts need to be "something unexpected and unexplored, and at the same time applicable to the specific narrative of the movie," says Francesco Corvino

Modelling & texturing

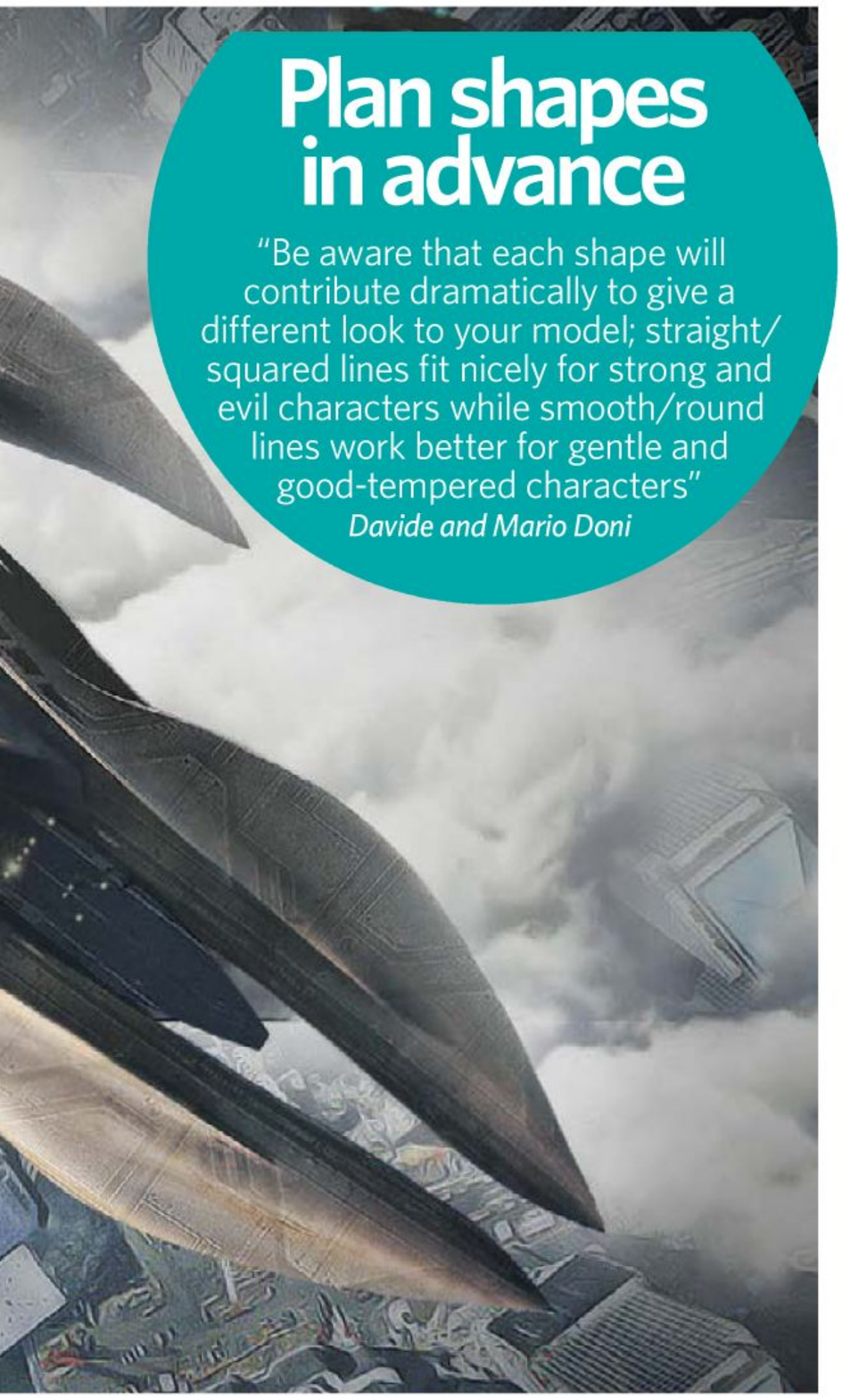
Whether you're building your ideas or someone else's, creatures, characters and worlds all need to seem functional as well as visually appealing

The look development phase can be one of the most interesting stages for an artist as Davide and Mario Doni explain, "It allows us to play with different colours and materials. In this step it's important to try different solutions. Even when you're theoretically sure of the look you want to go for, a little experimenting is always worth it." It's not just the concept artist who needs to explore anatomy textbooks and detailed plans of real machinery, the modelling and texturing artists need to have them to hand too, to ensure that things that look good could also – at least potentially – work.

For Simon Blanc, the "biggest challenge is to make something that doesn't exist look realistic, and not out of place. It's very hard for the human brain to accept something as real if it hasn't seen it before, or if anything looks fake or unnatural. Most of the time in sci-fi we have to work with a lot of metals, designs that don't really exist yet, so it's always a balance between making things look cool and futuristic but still making sense." Working with metals is also a big issue for Ben Erdt, who says that they are "fairly easy to create. There are also some neat automated processes out there to procedurally create surface detail such as edge wear, scratches, and dirt accumulation. However it is still important to look for reference and to do research in order to add these details with a logic instead of fully relying on algorithms."

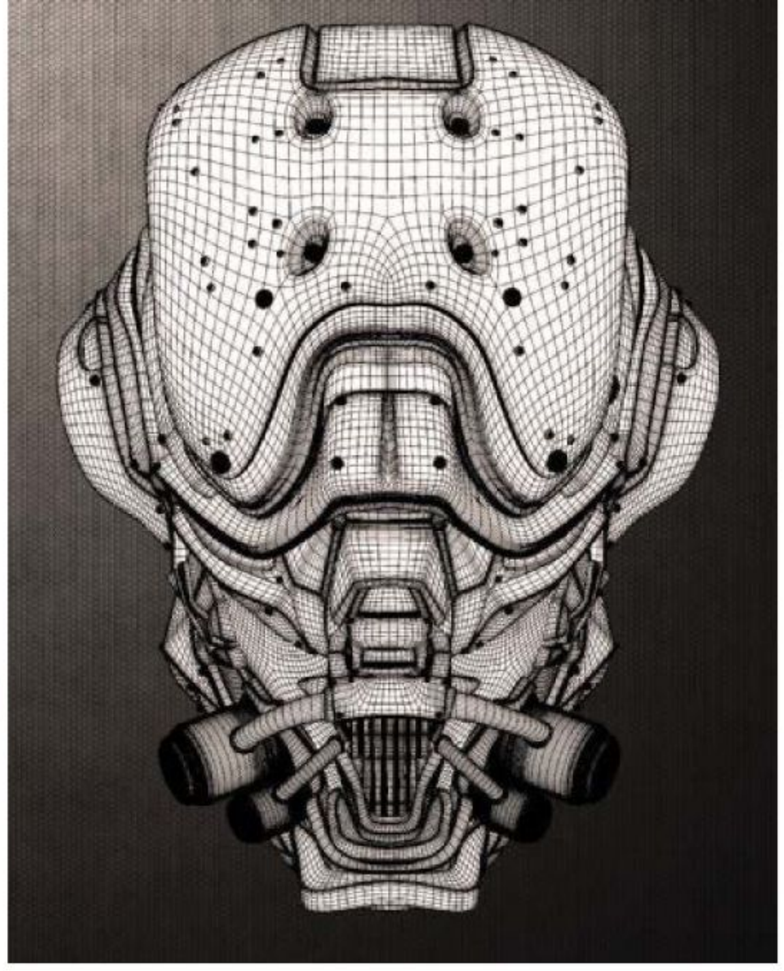
Once models begin to be built up on a project, then whole levels and environments begin to come together. "Most of the time when making environments, especially in games," notes Jason Godbey, "you want to make as few pieces or sections as possible so you can use them over and over again. If you made every area from scratch it would take forever. With a modular setup it is efficient, but if not executed well the environments can lack character if you just see the same structures again and again."

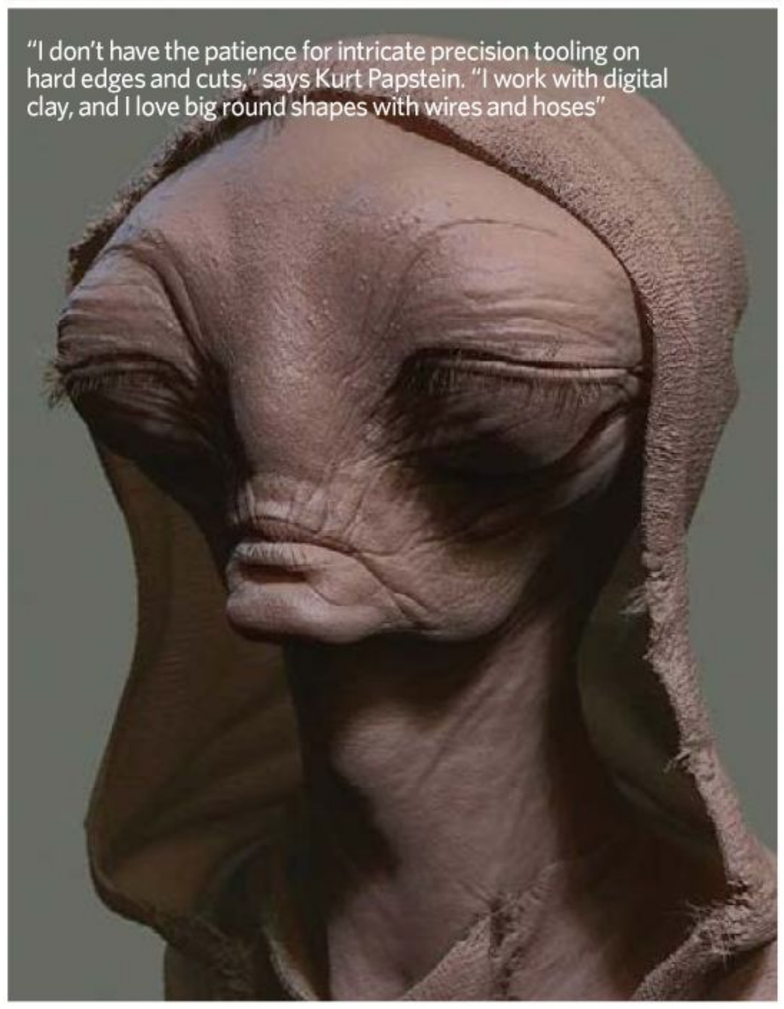
Most of Godbey's roles have been in games as an environment artist, so set dressing the levels is his goal, using Maya and ZBrush for modelling, and Photoshop and Quixel's DDO for texturing. "Sometimes," he says, "I've been part of teams where several environment artists tackle a single level and you're just responsible for modelling and texturing certain areas. In these roles it's easier to work in a vacuum and just focus on what you need to get done. I've also been part of teams where I am solely responsible for an entire level and I act as the hub between designers, concept artists, lighting artists, and FX artists. In this type of role, good communication between all departments is key."



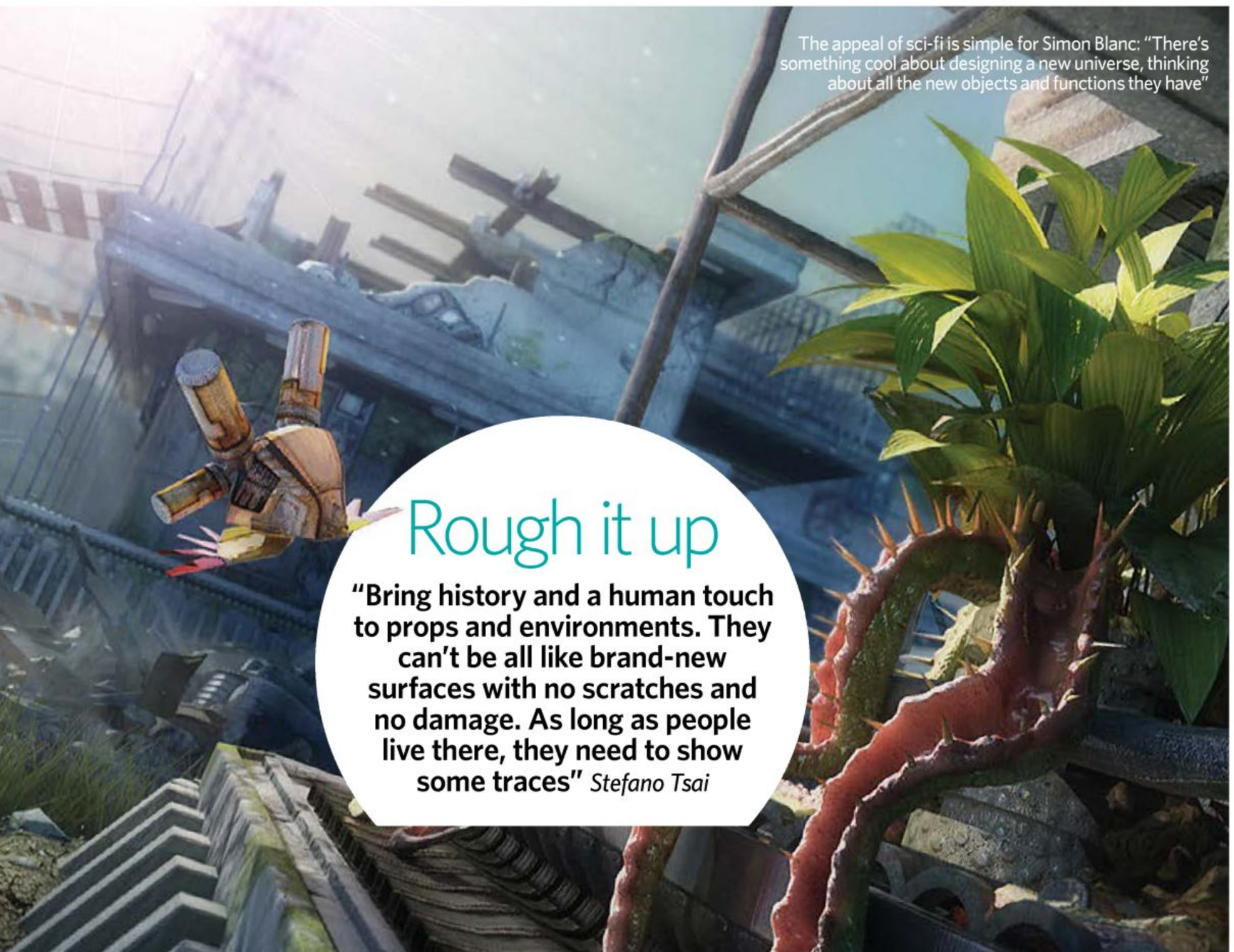
Plan shapes in advance

"Be aware that each shape will contribute dramatically to give a different look to your model; straight/squared lines fit nicely for strong and evil characters while smooth/round lines work better for gentle and good-tempered characters"
Davide and Mario Doni





"I don't have the patience for intricate precision tooling on hard edges and cuts," says Kurt Papstein. "I work with digital clay, and I love big round shapes with wires and hoses"



The appeal of sci-fi is simple for Simon Blanc: "There's something cool about designing a new universe, thinking about all the new objects and functions they have"

Rough it up

"Bring history and a human touch to props and environments. They can't be all like brand-new surfaces with no scratches and no damage. As long as people live there, they need to show some traces" *Stefano Tsai*

Modelling challenge

Mario Doni tackled the modelling for this helmet as part of a short course at Escape Studios

01 **Swap head for helmet** For the 3D for Visual Effects course at Escape Studios, the Doni brothers "first shot a footage with a basic dolly move of an actor walking through a corridor with markers on his face. The main goal of the project was to replace the actor's head with the digital helmet. The creation of the model itself has been a challenge!" Mario says that the modelling process all begins with "starting out in ZBrush" where he "sculpted a first version of the helmet from a single hi-resolution dynasphere."

02 **Working with Maya and ZBrush** Once he was satisfied with the overall look of the helmet, Mario "did the retopology of every single bit as a separate piece. The low-res retopologised model was imported in Maya for a bit of clean up and UVing and was then brought back to ZBrush. Here the model was then subdivided to reach several millions of polygons for the sculpting, during which he added small details such as bolts, gears, fans and so on."

03 **Mapping the results** "To increase the subdivision level of every piece," Mario "did an autogroup (to make every bit its own Polygroup) and then went for a 'group split' to make every piece a single SubTool. In this way it was possible to sculpt one piece a time at the highest reachable subdivision level without slowing the computer too much. The sculpts were saved as Normal and Displacement maps, and applied on the low-poly helmet."

Lighting, rendering & postproduction

More than just the final spit and polish, lighting and rendering can often be key in determining tone and mood of the piece

While *Blade Runner* is still the go-to film for neo-noir sci-fi inspiration, there are plenty of other moods and styles that can comfortably exist in the science-fiction universe, as Stefano Tsai found out when he started work on the comic *BPI*. It was a big challenge because it was a cartoon 3D rendering project. Tsai used V-Ray as his rendering engine, and "The most difficult part was to make images interesting. It is so easy to make boring Toon Shader images, [but] you lose so much details on surfaces; all subtle lighting and shader details are so easy to kill. In the early stage, I tried to push the look of a pure line-drawing comic. It looks cool in the beginning, but it changed course very quickly."

To make his comic book style scenes look interesting, Tsai tried various different options, but no matter how much he tried he felt that something was missing. He continues: "I realised that I must be missing one fundamental element in my scene and that was 3D itself... I had to make it more 3D looking. The 3D look is actually ambient occlusion (AO), so I started adding one more layer with AO." This made Tsai realise how hard minimalism is. "It is so easy when you can use shaders, good materials, realistic lighting and good rendering – especially when you need those to make your sci-fi project more believable," Tsai adds.

And believability is the core issue in all sci-fi. Things can be inventive and different and dramatic, but the audience has to buy into it, or the story doesn't work and the world falls flat. Corvino has seen more interest in visualising sci-fi in a "more grounded and realistic way" recently. "Designing with this intent makes everything feel more authentic and believable," he explains. "With sci-fi you really need to find an intelligent balance. Sometimes you are tempted to push things to the limit, showing designs never seen before, and as I said, I think that sci-fi is all about exploring uncharted territories. However you have to be careful with the freedom the genre gives you. It's easy to slip into crazy designs that quickly become overwhelming and nonsensical."

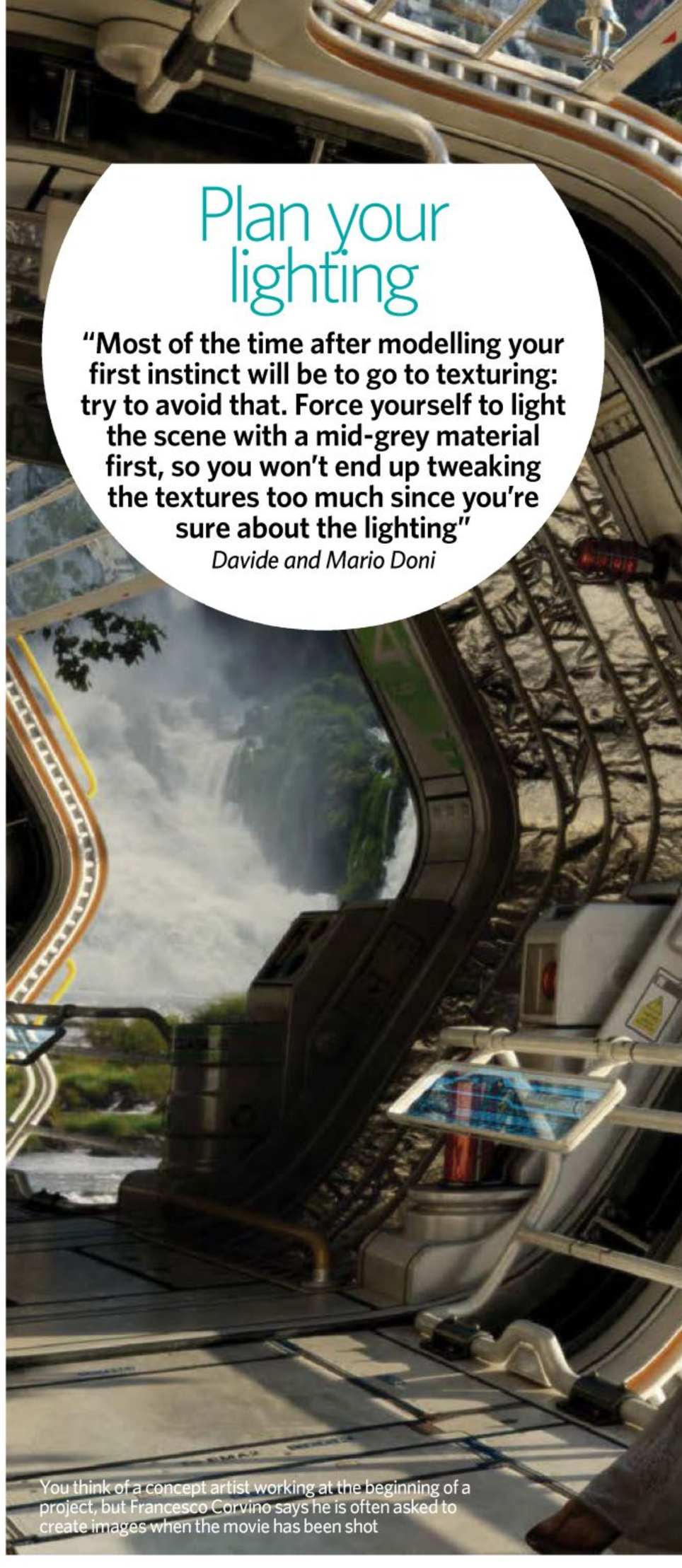
And for Corvino, this is even more of an issue when he's stepping up to the plate as a matte painter. "When you're creating a matte painting you're not necessarily designing," he explains. "More often than not a matte painter will receive a concept from somebody else and he's requested to make it look photoreal." Because, when sci-fi is done well, Figini says it can "make the impossible seem possible. It's a window into a future or another world."

From concept to render, sci-fi demands inspiration, vision, and dedication. But it doesn't require all the answers. For Papstein, this is what makes sci-fi so compelling, that "it's a genre that gets us to ask the big questions and look up and wonder. So take advantage of that and make your concept tell a story that invites the viewer to wonder and fill in the blanks a little..."

Plan your lighting

"Most of the time after modelling your first instinct will be to go to texturing: try to avoid that. Force yourself to light the scene with a mid-grey material first, so you won't end up tweaking the textures too much since you're sure about the lighting"

Davide and Mario Doni



You think of a concept artist working at the beginning of a project, but Francesco Corvino says he is often asked to create images when the movie has been shot

Environmental lighting

Jason Godbey explains how lighting is make or break when it comes to environments, mood and sci-fi success

"One thing that helps is having a dynamic composition in the design which allows the assets to be seen at different angles and under different lighting conditions. This helps mask the fact they are used all over the place. Having a couple of really unique assets that are used very sparingly, like a statue or debris, can help break the sense of repetition as well.

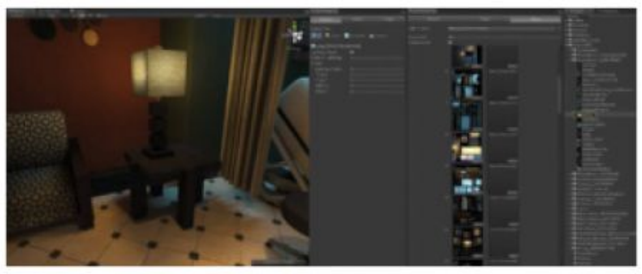
"In a lot of my work I try to create areas that imply the environment is bigger than what is seen. This could be just showing the bottom of a staircase or a slightly open door with light streaming through. In the image [shown on the right] I wanted to convey a sense of some comfort in the foreground with the bright warm light and create a sense of unease in the background with the red key light and cool ambient light. The sense of unease is heightened by the fact that the source for the red light is out of sight. Not knowing what is around the corner, but yet knowing something is probably there, builds tension in the scene."

Lighting for Unity

The lighting was a real challenge for Jason Godbey when he working on a project with real-time scenes running with the Unity 3D game engine

01 **Don't tile...** At the time the lighting capabilities in the engine were limited and I wasn't able to get the look I wanted. So to get around this I used V-Ray to bake out lightmaps for the scenes. I had to make a second UV set for all assets or groups of assets and light them inside 3ds Max with V-Ray. I made sure the UVs were within the 0-1 space since the the lightmaps don't tile.

02 **...bake instead** Once the lighting was the way I liked it I baked the lighting to the second UV set using the VrayTotalRawLighting render element and saved them out as an OpenEXR format.



03 **Draw a lightmap** I brought them into Unity, assigned the object a number in the Lightmap Index under the Object tab from the Lightmapping window, and then in the Maps tab, I plugged the lightmap of the object into the assigned number slot. It took a little more work to go this route, but to me the results were worth it.

"Each artist is unique and has his own way of doing things," says Francesco Corvino. So his advice is to "understand your strengths" as this is "the best way to get your talent flowing"

Render & render again

"Don't waste your time tweaking tiny numbers inside the slots of your shaders. Keep in mind that using render passes you will be able to precisely tweak the look of your assets after the main render" *Davide and Mario Doni*

SCI-FI
From Concept To Render

Render a superhero

In this tutorial we will explain in just six steps the methods and techniques we can follow to present our figure in a more attractive way. We will show you in a simple and practical way how we should prepare our model so as to be able to texture it and then export it to our 3D platform for rendering, regardless of our main software. Among other things, we will learn how to paint it by using masks, how to optimise the amount of polygons, create shaders, light our scene, and finally, touch up our render to generate a much more attractive and artistic look.

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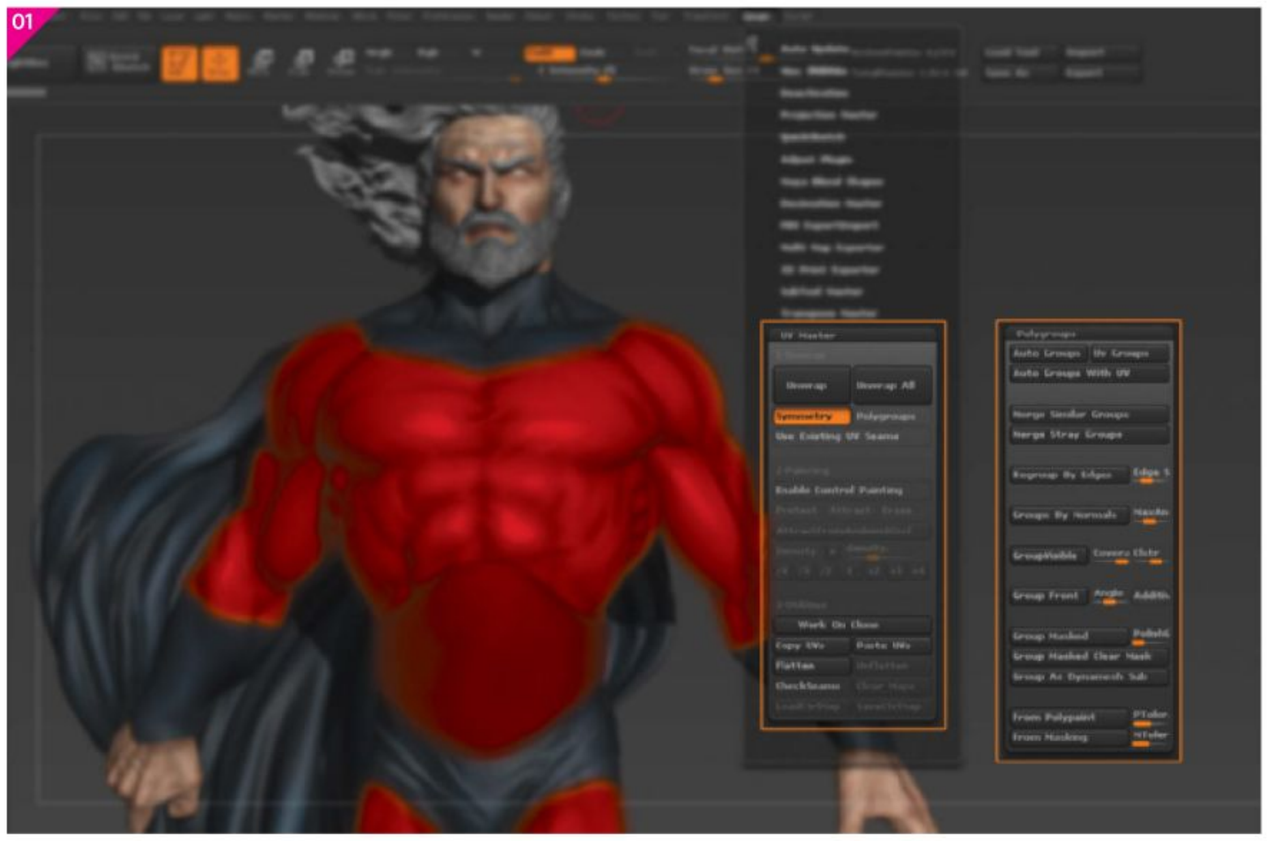
01 Prepare your model Before starting to paint our model, we should generate the mapping coordinates of each of the parts that conform our figure. Although this process can also be made after painting the model, it is advisable to do it before so that when we're exporting each texture map, we can check or modify as and when we want over the unfolded UV. To do this, we can use the tool UV Master from the menu ZPlugin, simply by clicking the Unwrap button. Besides mapping coordinates, it is convenient to keep our figure clean and tidy. To do this, we can group different parts of the model using the Merge button in the SubTools panel, for example for everything containing the same colour or material. Likewise, we can use the function Polygroups with the same purpose.

02 Paint with Polypaint To create all the textures of this figure we used the Polypaint tool, which is simple and practical to use. To do this, first choose a base colour from the colour selector, for example yellow or red for the suit. Then, go to the Color menu and click on Fill Object to colour the entire object at once. To add details in certain areas, use the 'Mask by Cavity' tool from the Masking palette. After applying the mask, click on Fill Object (with another colour) in order to colour the masked areas and, thus, the rest of the pieces. We can also do some touch-ups with standard brushes.

03 Exporting to 3ds Max Before exporting the figure to our software, we will perform some actions to optimise the number of polygons of our model, so as to be able to manipulate it better after importing. For that, we go to the ZPlugin menu and then to Decimation Master. We tick the Keep UVs option and then we click the Pre-process All button. Once this process is complete, we select Decimate All. Usually, a 20 per cent decimation quality works fine, but let's try different values until we are satisfied with the amount of polys. Having done all this and with our model now optimised, we go to the Tools menu and click the All button to export all of our SubTools.

01



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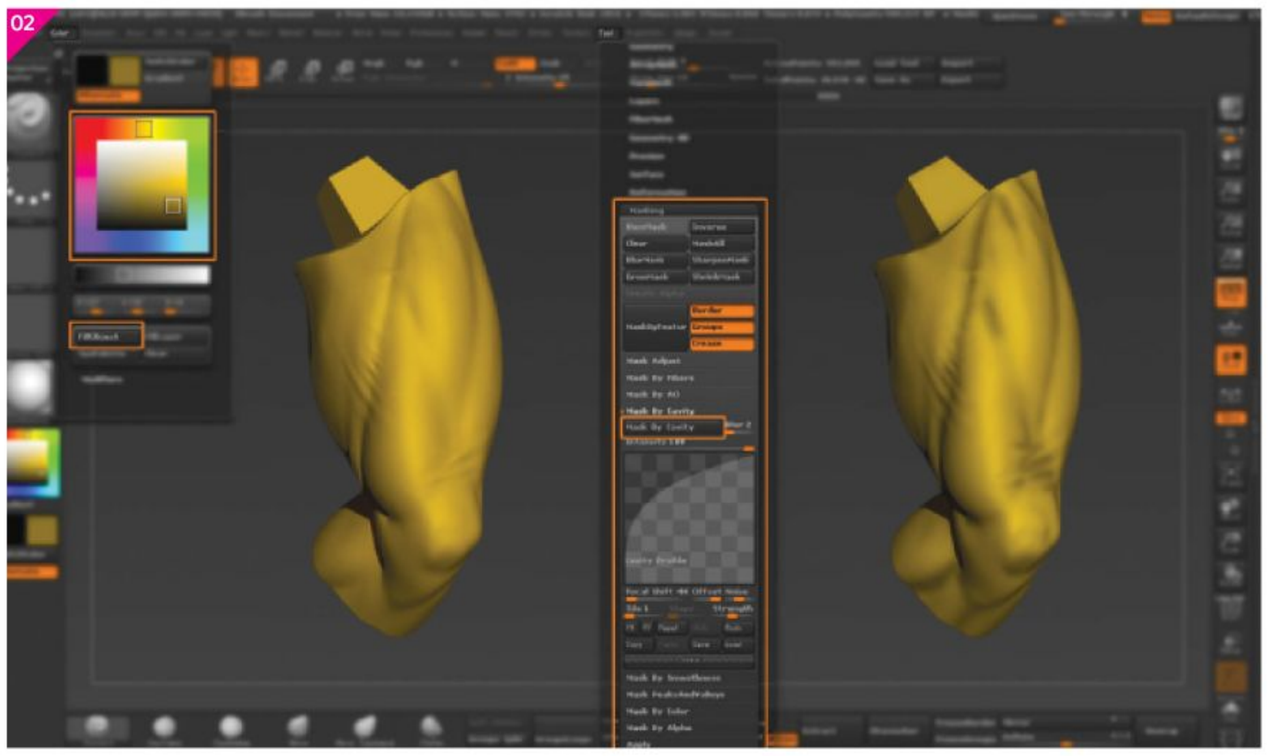

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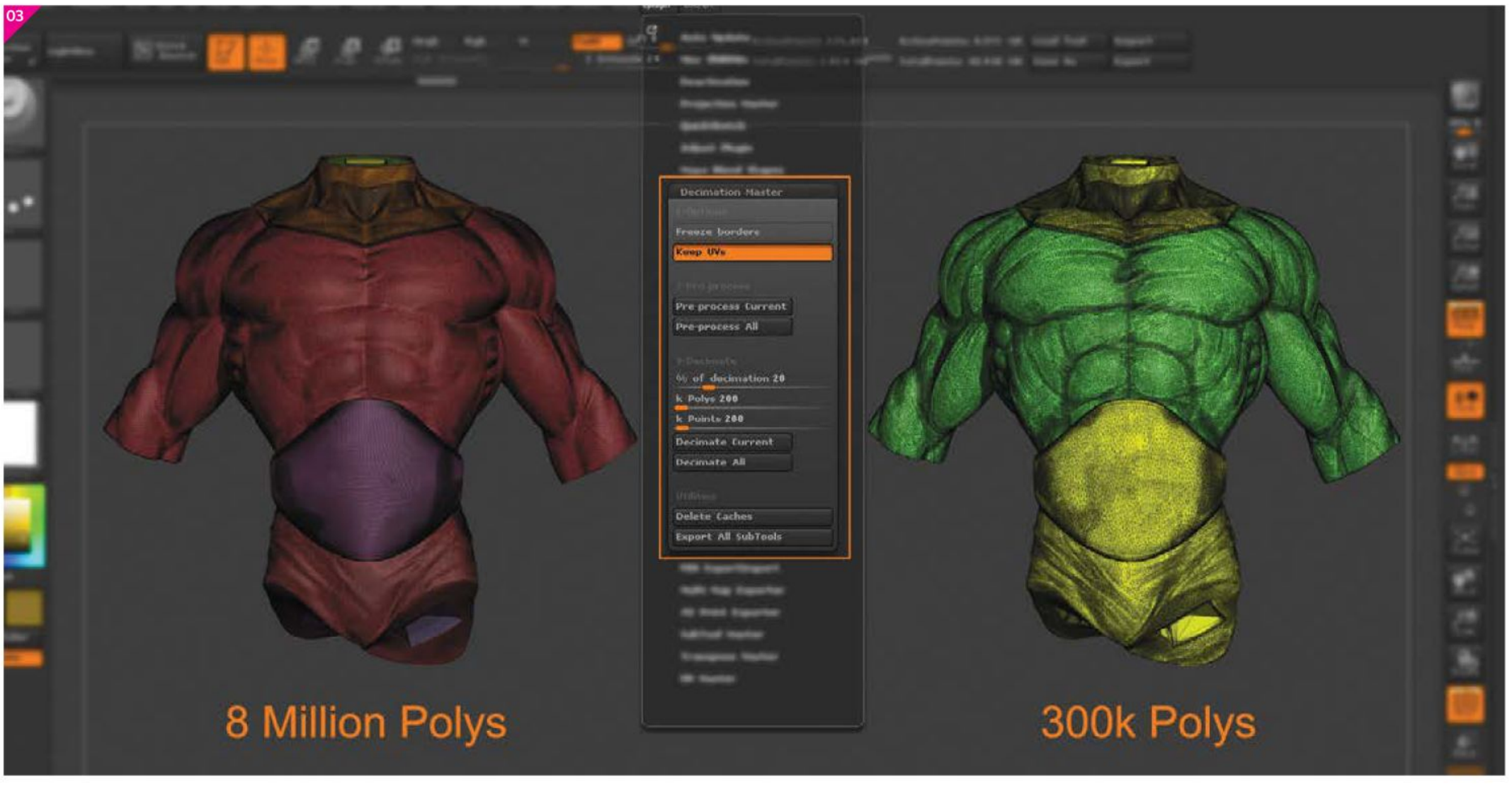
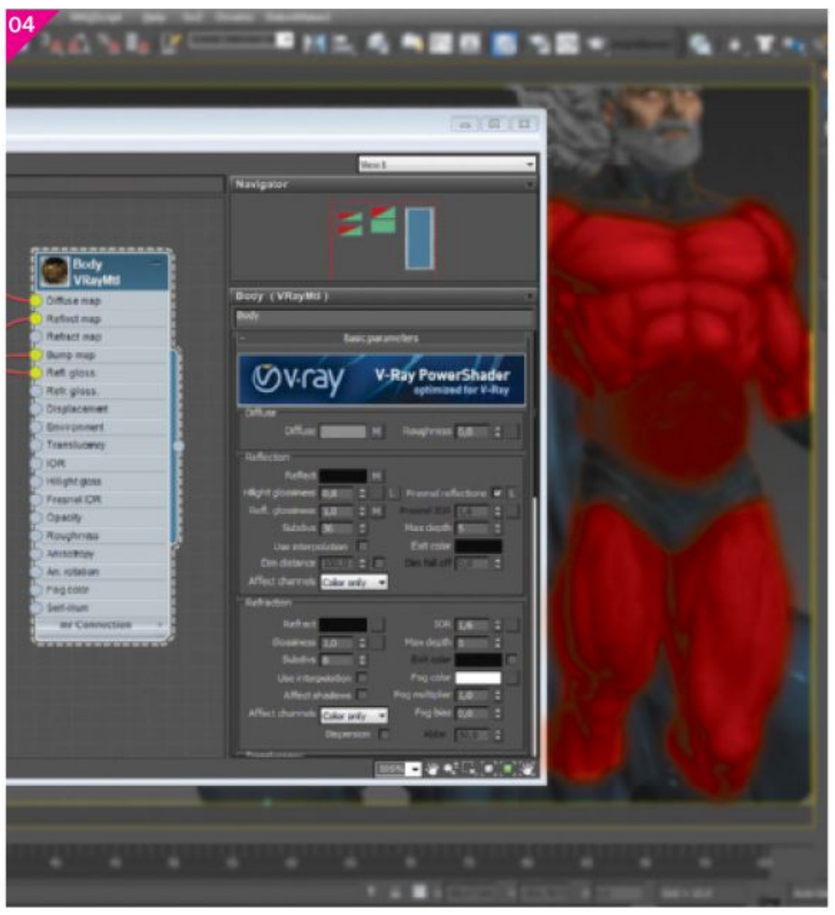


04 Create materials Once we have the model imported into our 3D platform, in this case 3ds Max, let's assign materials to each part. The materials that were used in this model were very simple with only a few variations among them, just to differentiate the plastic, metal, matte and glossy parts of the figure. We create a VRayMtl in our Material Editor. Then, we load the diffuse textures previously created in ZBrush, and we adjust and play a little with the grey values and colours of reflection, glossiness reflection, highlight glossiness, Falloff IOR and number of subdivisions in order to achieve good quality materials.



05 Add some lights Now that we have our model materialised, we will suggest a point of view that interests us, and then place a camera so as not to lose the frame. Once this is done, we use VrayLights to light our scene. For this piece we used a rather classic set with a few changes: the well-known three-point lighting process. To do this, we place a strong and cold light on the back of the figure, which will serve us as a rim light. Then, we add another one on the right front, but this time with a soft warm light that will give us some light on the front. Finally, we place a warm and a bit more powerful light on the left as a filler. Now just render!

06 Postproduction Finally we get to postproduction, which is the final stage of every render. In this case our image is a still, so we used the image editing software Photoshop and an additional plugin for it named ArionFX. To work more comfortably and have a much higher dynamic range when editing the image, we saved the render in EXR 32-bit format. Depending on the type of the image, we will use the tone-mapping options from ArionFX and this can include ISO film, Midtones, Saturation, Whitepoint, Compression, Details, Radio, Threshold and Base. We will use them for toning our render and to give it our own personal artistic touch.

Important tips

If we are to use our model for rendering, it is important to export our maps in a nice resolution (4K at least), because even if we don't know how close the camera is going to be, we'll still be covered in this way. As a general lighting tip, it is important to know the role of each of the lights we have in the scene, that is to say, we'll avoid adding lights just for the sake of it. This is because it will cause our render to take longer and make us lose control of what we want to convey when we are lighting our figure.

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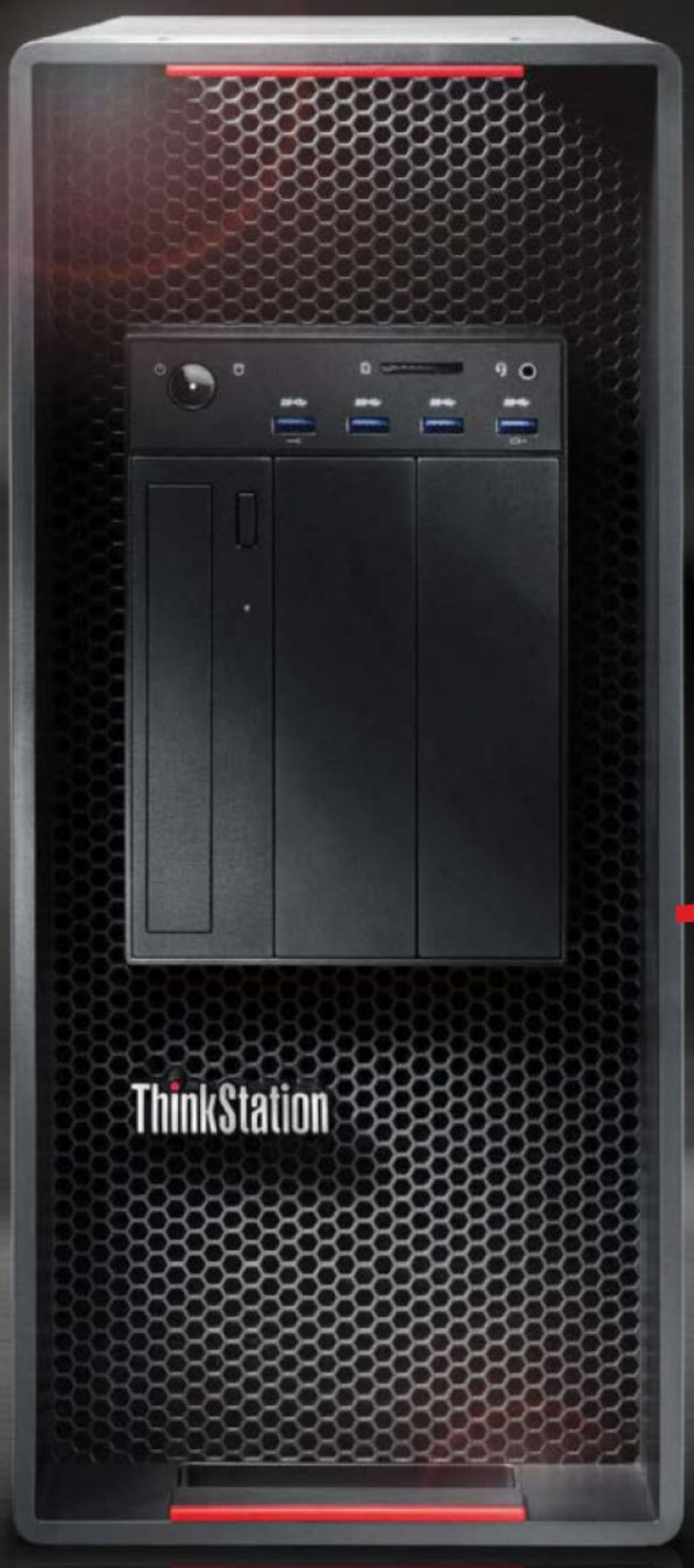

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SCI-FI
From Concept
To Render

> Develop big nice shapes and find a balance between them. Try to find a key curve that defines the flow of the design

Construct a luminescent, high-gloss mech wolf

Use ZBrush, 3ds Max and more to render a luminescent, Eighties-style mech creature

The main idea in this mech wolf tutorial is to understand key steps of a 3D concept production and develop a really good and fresh look for your model. We will lead you through a really creative and natural 3D sculpting process in the first part of the tutorial. After that we will show you how to quickly create stunning details using next-gen Booleans with MeshFusion. And the last part is dedicated only to the visual development part. We will try to find a unique look for your mech using inspiring references and then using only Photoshop, we will do some stunning postproduction work – repainting our reflections and adding smart accents to our final composition. We will explain which workflows will suit which parts best, whilst still staying loose by switching to different packages to apply their best features. Enjoy!

DMITRIY RABOCHIY
Mech Wolf, 2015

Software
ZBrush, 3ds Max, MODO, Fusion 360, Photoshop, KeyShot

Learn how to
- Sculpt hard surfaces
- Work with retopology
- Use an advanced Boolean workflow
- Set up rendering
- Work in postproduction with your render

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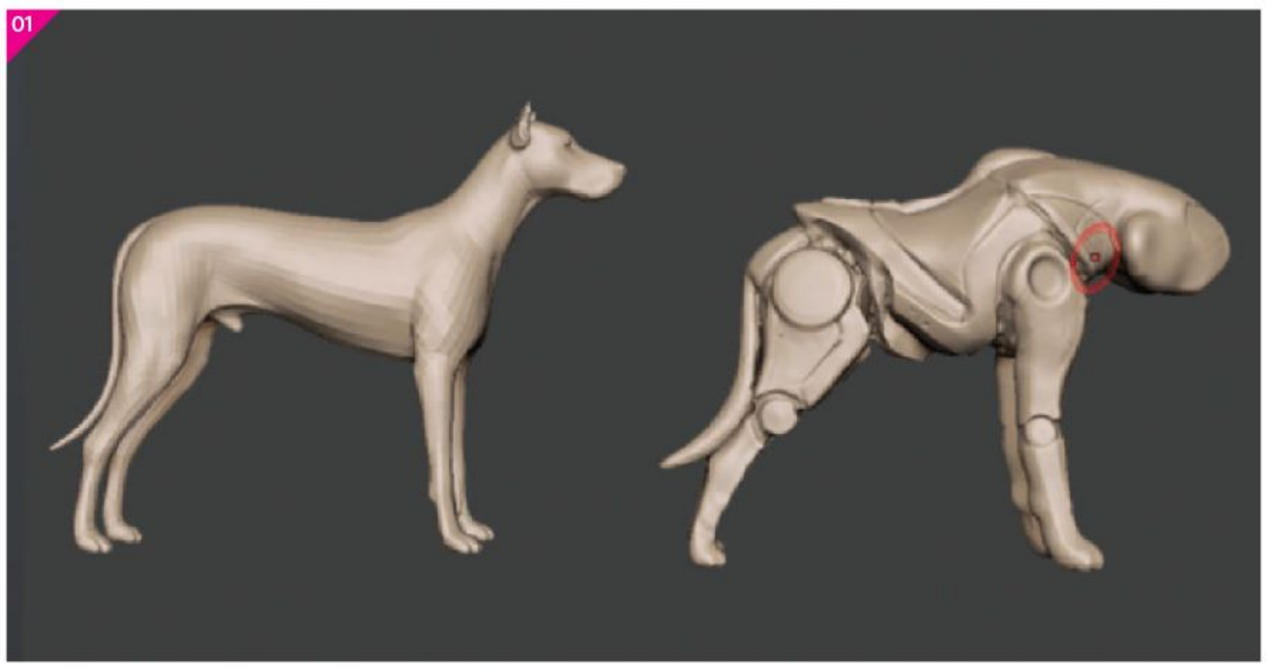
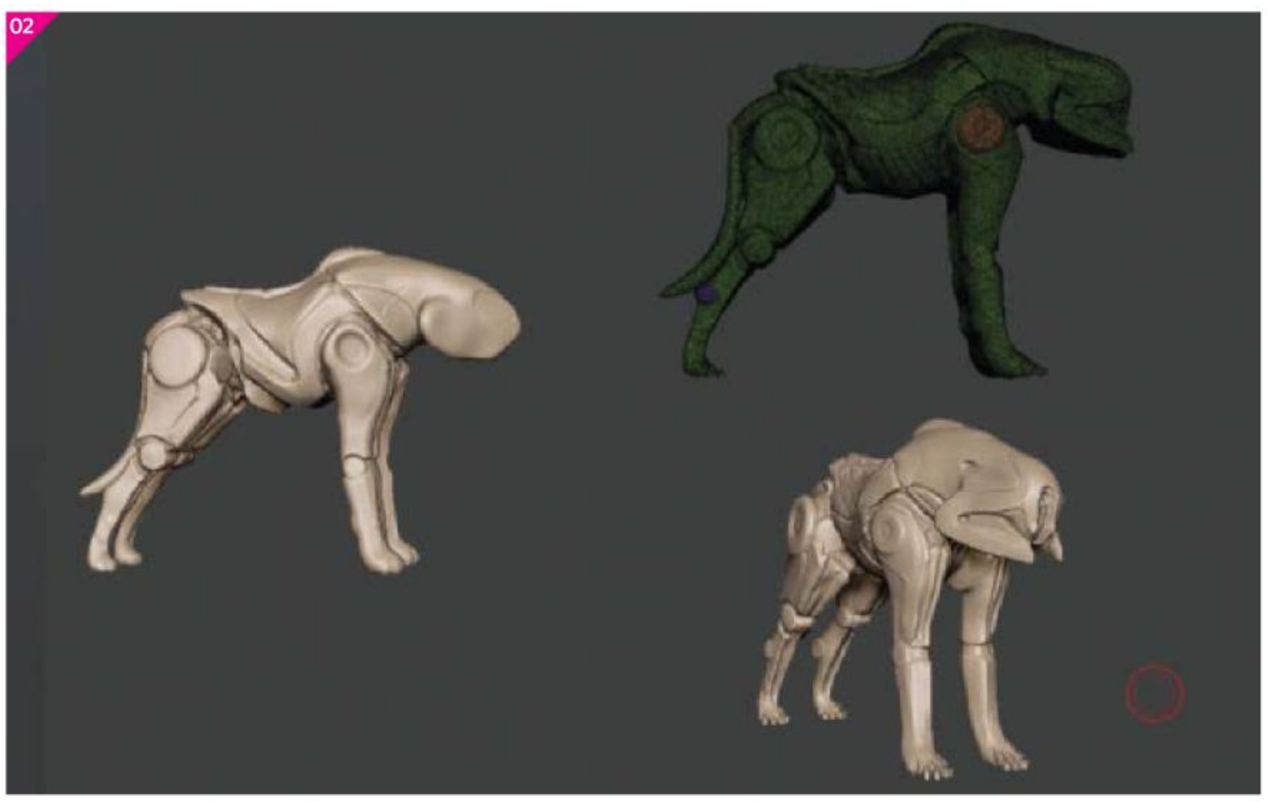
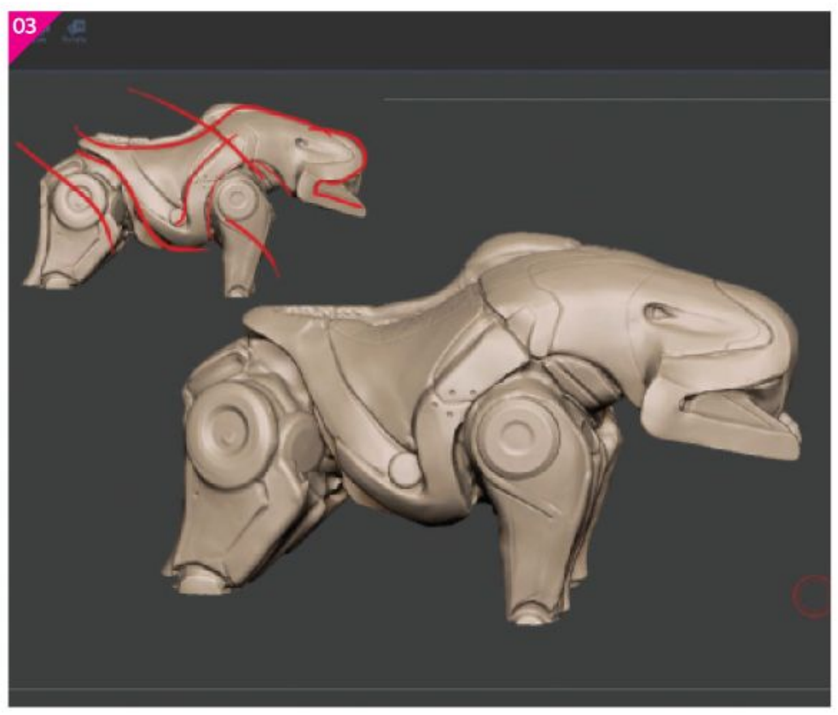
01 Block-in stage We've started using a dog base mesh because we wanted to retain the basic anatomy and gestures. We should spend more time on tweaking proportions so that they're closer to a wolf than a dog. Picking the Move brush and pressing the V key allows ZBrush to show a black silhouette for you to adjust.

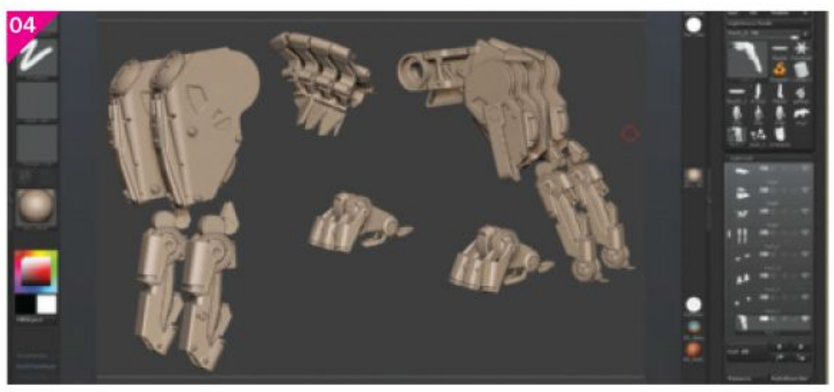


02 Major shapes The main idea is to develop nice big shapes and find a balance between them. Try to find a key curve that defines the flow of the design. Dam_Standard combined with the FormSoft brush is a perfect solution for us. The big joints were done using the InsertCyl brush and of course all of these are separate DynaMesh parts with different polygroups. This means we have a lot of control over the design in general. Our main workflow idea is to stay as freehand as possible in the sketch stage so the idea is to not use Alpha or kitbashed parts.



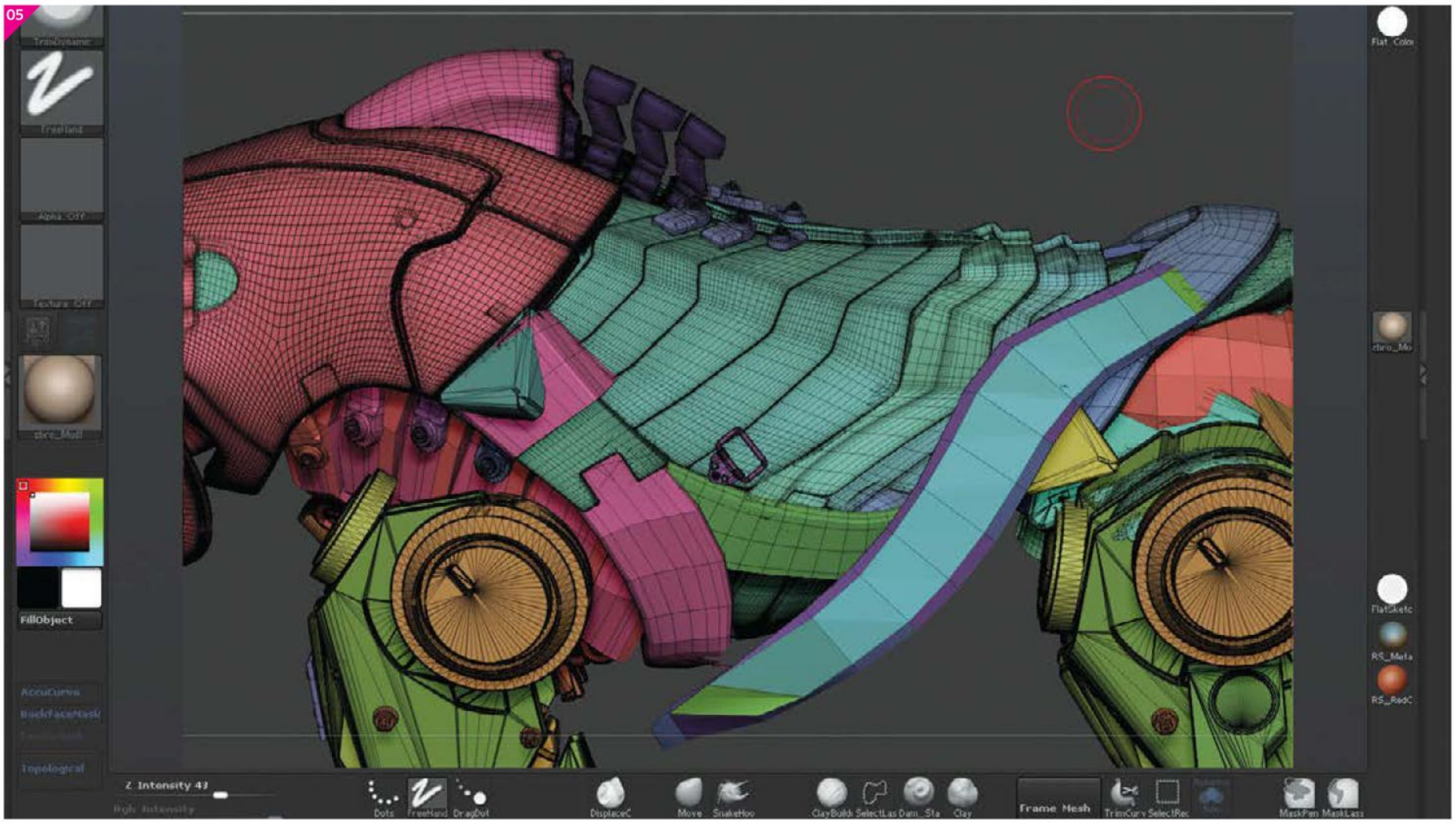
03 Define the upper body Isolate the upper body of the wolf and try to work on making each part more accurate. This is the right time to find good references. Choose as many mech ideas as you can and find the feel you want to achieve. Remember that you live in a world that produces tons of information and the more you get, the better result you can expect in the end. We started with a motocycle-style frame and soft flowy shapes that begin at the wolf's jaw. Try to follow the main line and cut the lines in a kind of rhythm.





04 Fusion 360 The best solution for a hard-surface tool is Fusion 360. The way it works is so simple and effective; you can spend a few minutes modelling each part compared to several hours using classic modelling tools. Aim to build useful and unified parts that you can rotate and combine in different ways. We've modelled a simple, thick arc here for this. Now just send it to 3ds Max from Fusion and bash a simple leg. Use Symmetry scale and Edit Poly to bring some variation into your design.

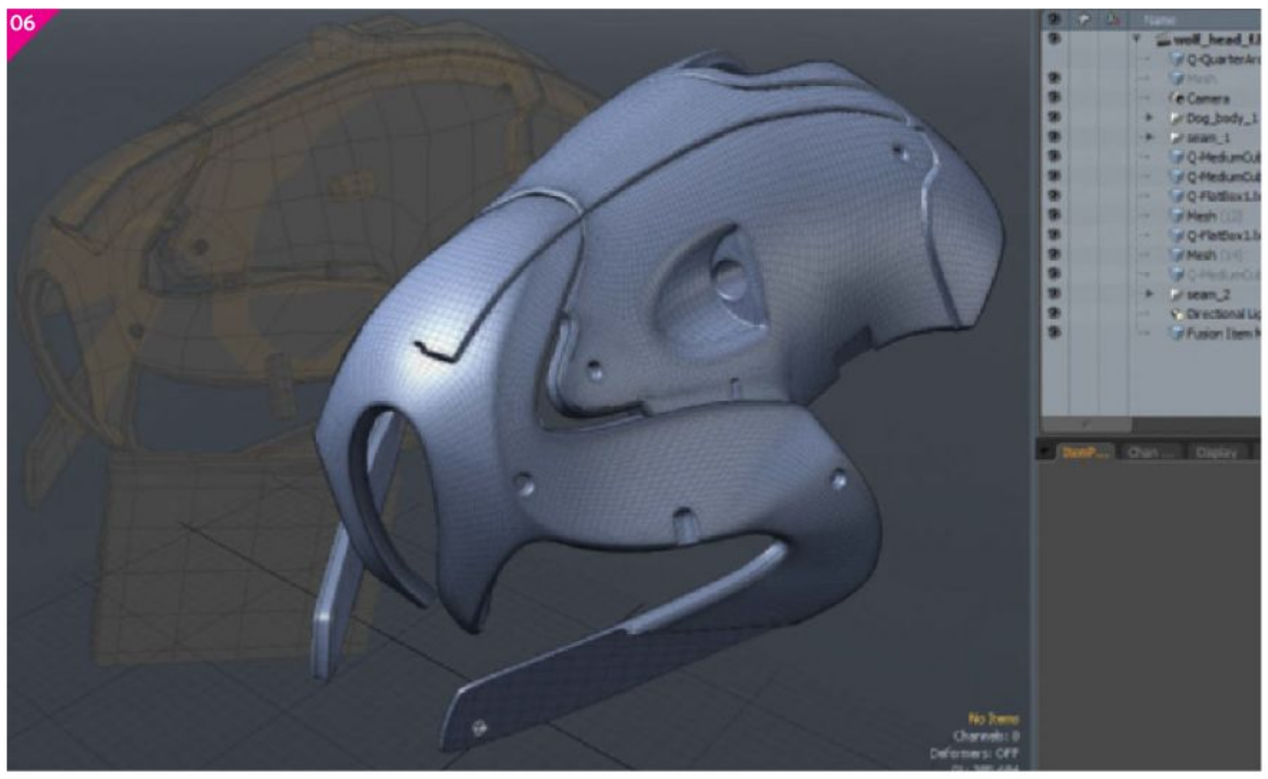
Be smart
Find the best base mesh you can. It is a real time-saver for you. Feel the curves of whatever real-world object you are using and stick with them in your final design. Build your design along the hard points so that you are able to follow main joints, limbs and structures when doing hard body design. Also it is a good idea to find a good material and implement it even in the beginning stages. These tips are important for creating believable artwork.

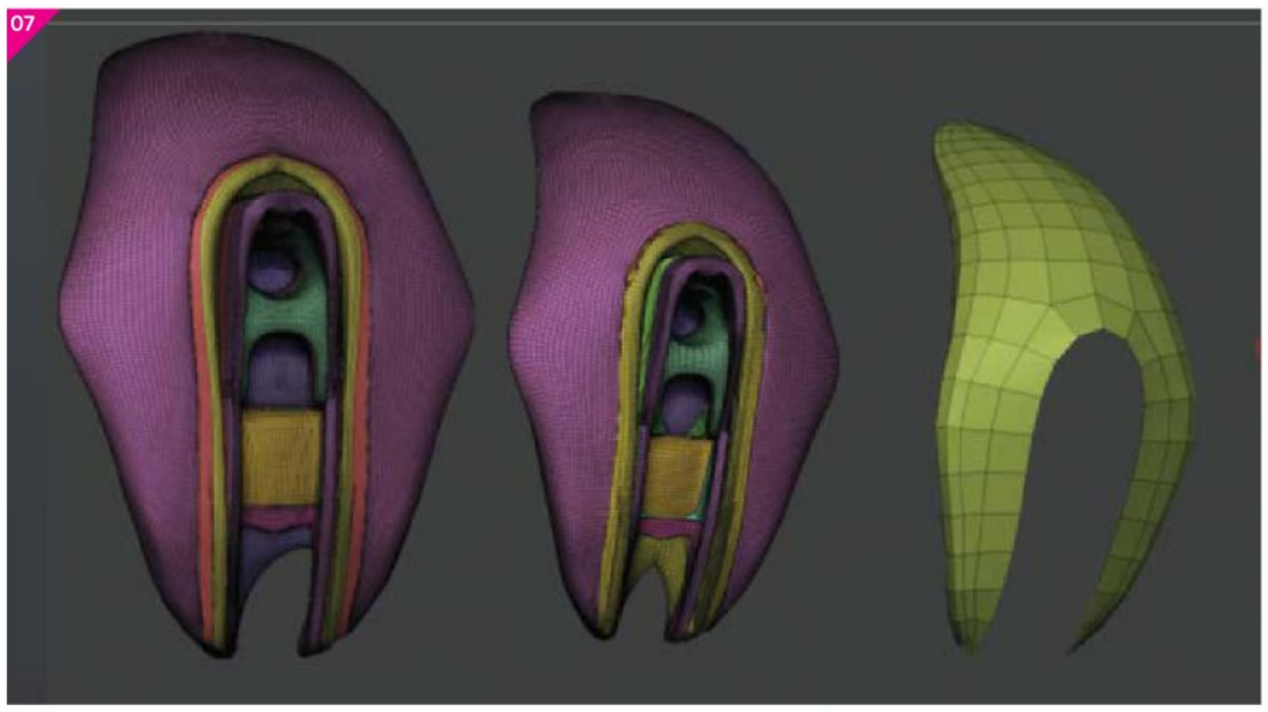


05 Retopology After the design is finished you may want to clean it up. The main tools we used here are ZRemesher and 3ds Max's retopology functions. Import a decimated sketch to 3ds Max and start defining major topology. Try to keep these as simple as possible by drawing the main curves that are holding the mesh. Try to draw the loop through the whole model so you can control the shape in a clear and logic way. Then add smooth controlling support loops and slide them in. After you finish that stage use GoZ and put everything together. We only care about the look and and not the production values here, as we are able to change these later on in Photoshop.

06 Advanced Booleans Problems can happen all the time whenever you are working with minor details and subdivision surfaces – that's when MODO can save you lots of time. Just send the head sketch to 3ds Max and start doing simple retopology while preserving quad structure and big polygons at the same time. We will need this simple topology in MeshFusion because we want a really simple edited wire. So before sending your image to MODO, try to clean everything up. Import the head to MODO and start adding small details using built-in Qbics and drawing custom seams. Set the resolution as low as possible, and this way we will still have an easy-to-manipulate model later.

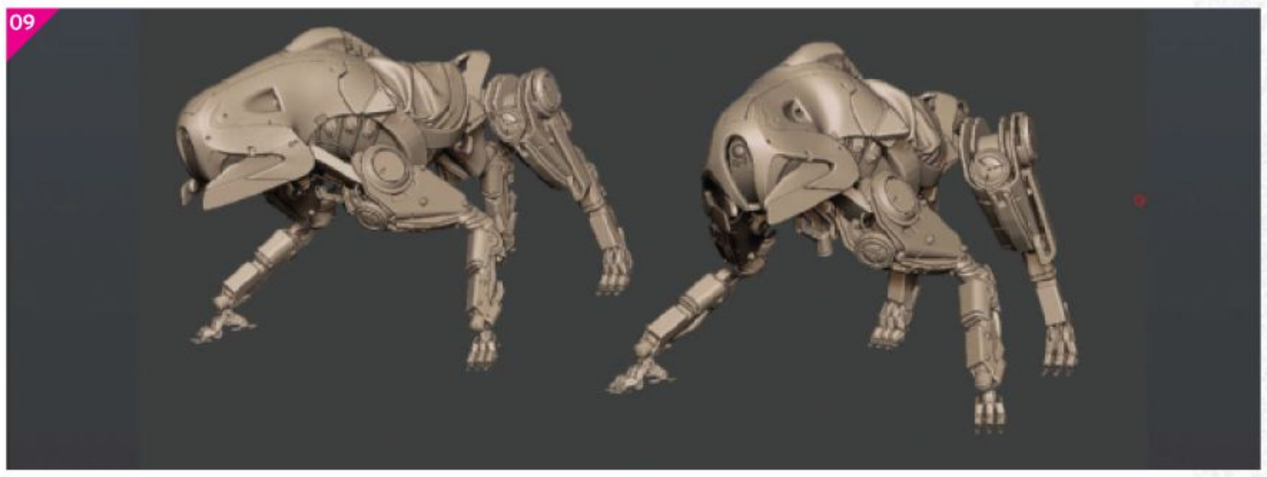
07 ZRemesher This is a function that is extremly helpful and a great time-saver. Select a sketch part, and slice it into polygroups. Keeping polygroups separate will help ZRemesher to find a nice topology and reduce it to a small poly count. Turn on 'Keep groups', select the ZRemesher Guide brush and apply frame mesh. Start ZRemeshing and once you have basic loops you can try to slice them again. Proceed further to lower your poly count and find a good balance. Then split everything into SubTools and ZRemesh again.



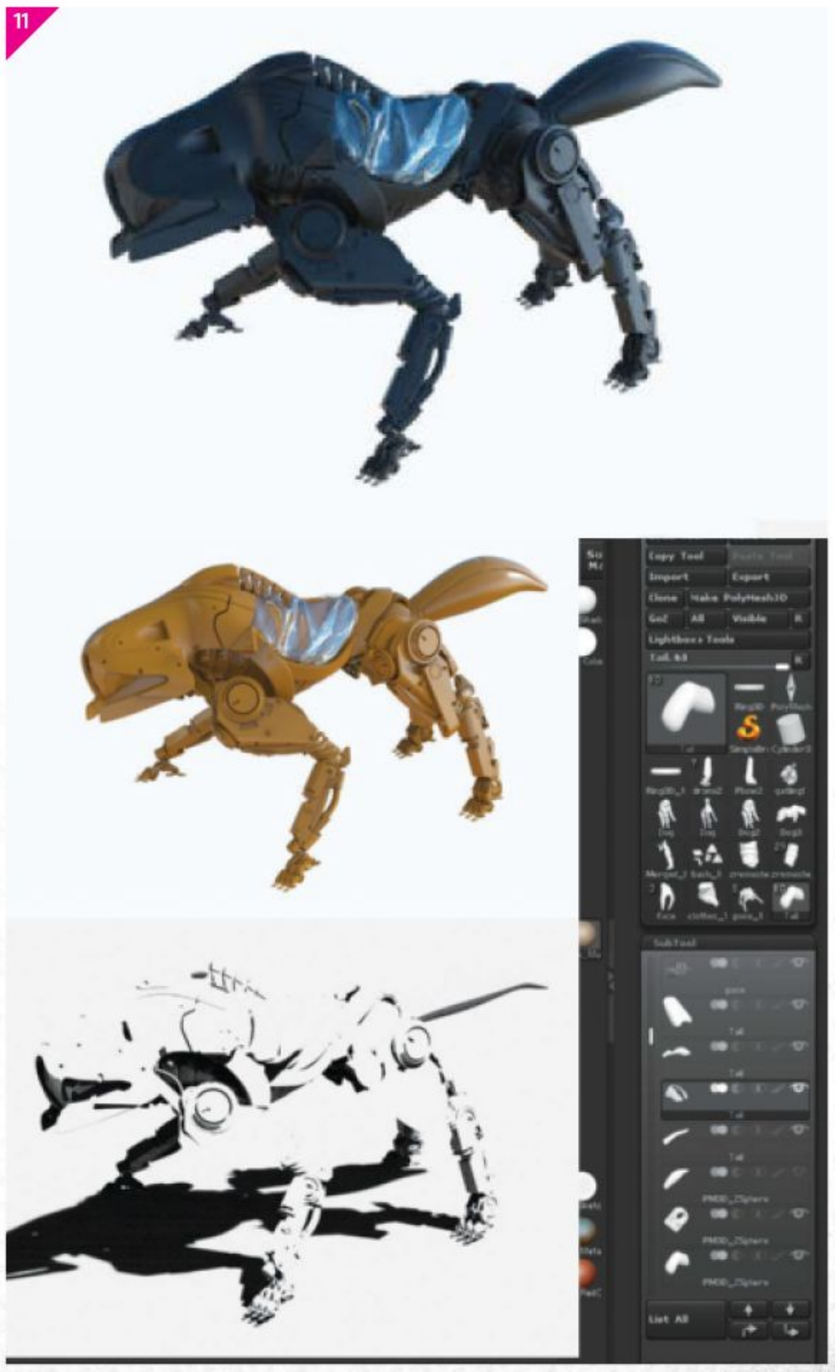


08 Material contrast We want to create different materials to break the design and make some areas that are relaxing for the eyes. We've rushed into Marvelous Designer and chosen a default avatar for this: a simple wrapped cylindrical cloth. After that, import the upper body to Marvelous Designer and wrap it with cloth parts. Set the wire type to Quadrify. The next step is importing into ZBrush. When you are done with importing, press the Dynamic Subdivision button to smooth whole faces. Now we have fully finished parts.

09 Final assembly and posing Import every part into 3ds Max using GoZ. Now use the Link tool on the moving parts, connect them and set every pivot to its logical location. Using only the Move and Rotate tools, pose the wolf. In ZBrush, slightly move and rotate the head to add small dynamics to the pose.

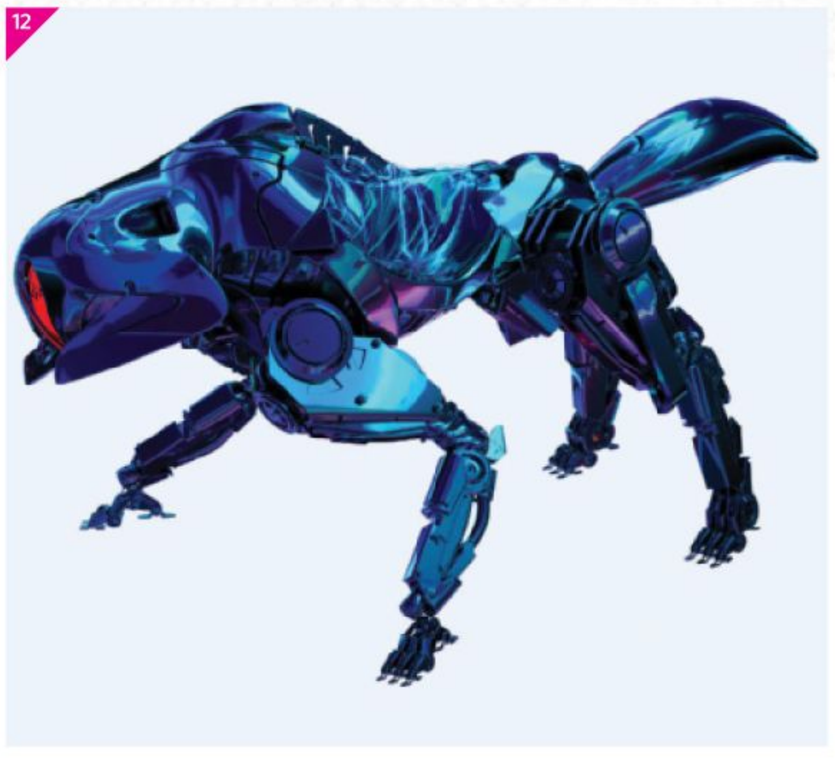


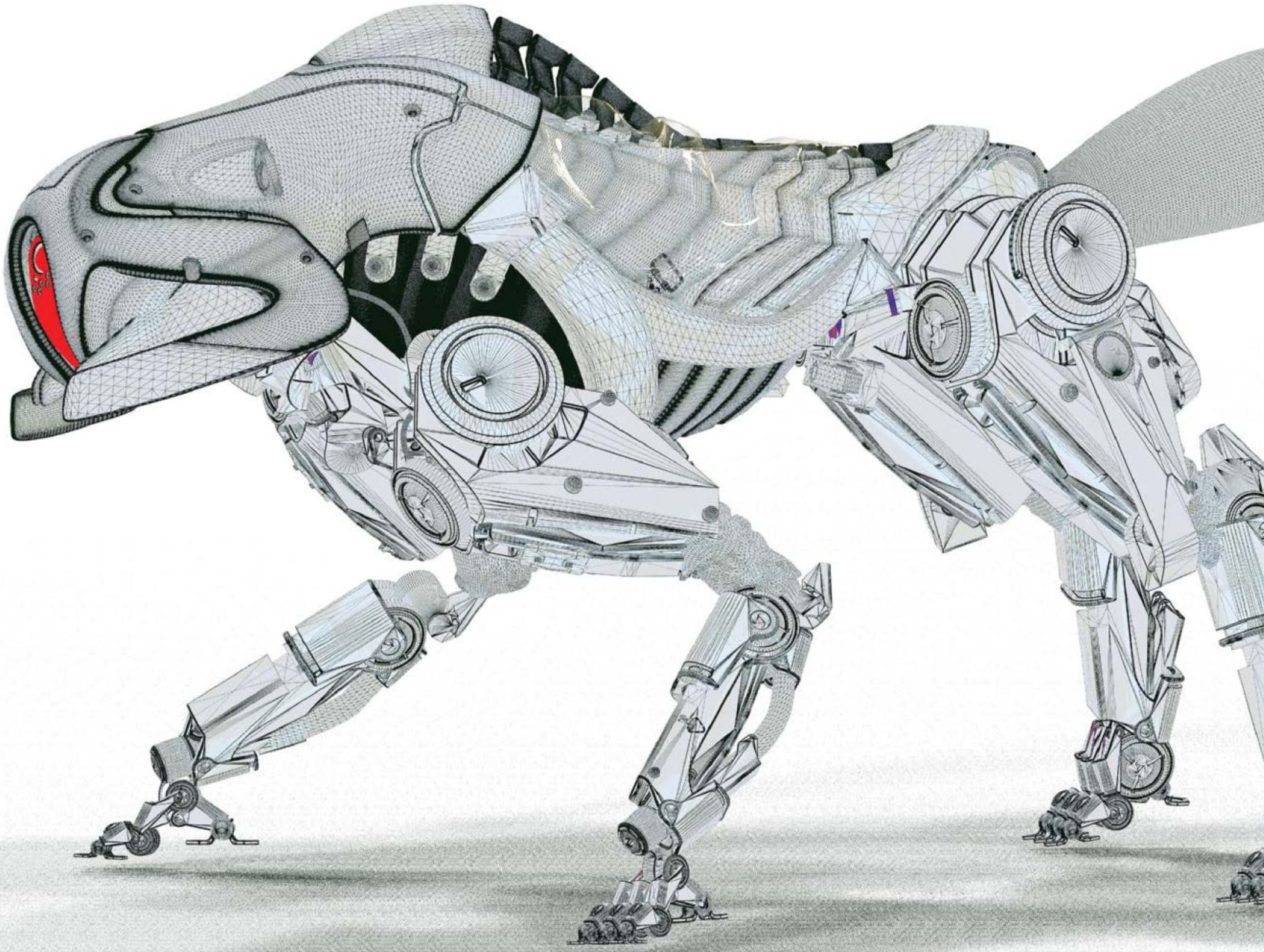
10 Critique yourself Don't be afraid to kick yourself while looking at your design. We felt a lack of balance in the tail area and sculpted a simple base mesh using ZSphere, converting it to DynaMesh. Next step is to quickly slice this into groups for further ZRemeshing. Add ZModeler touches for the final look and place each part.

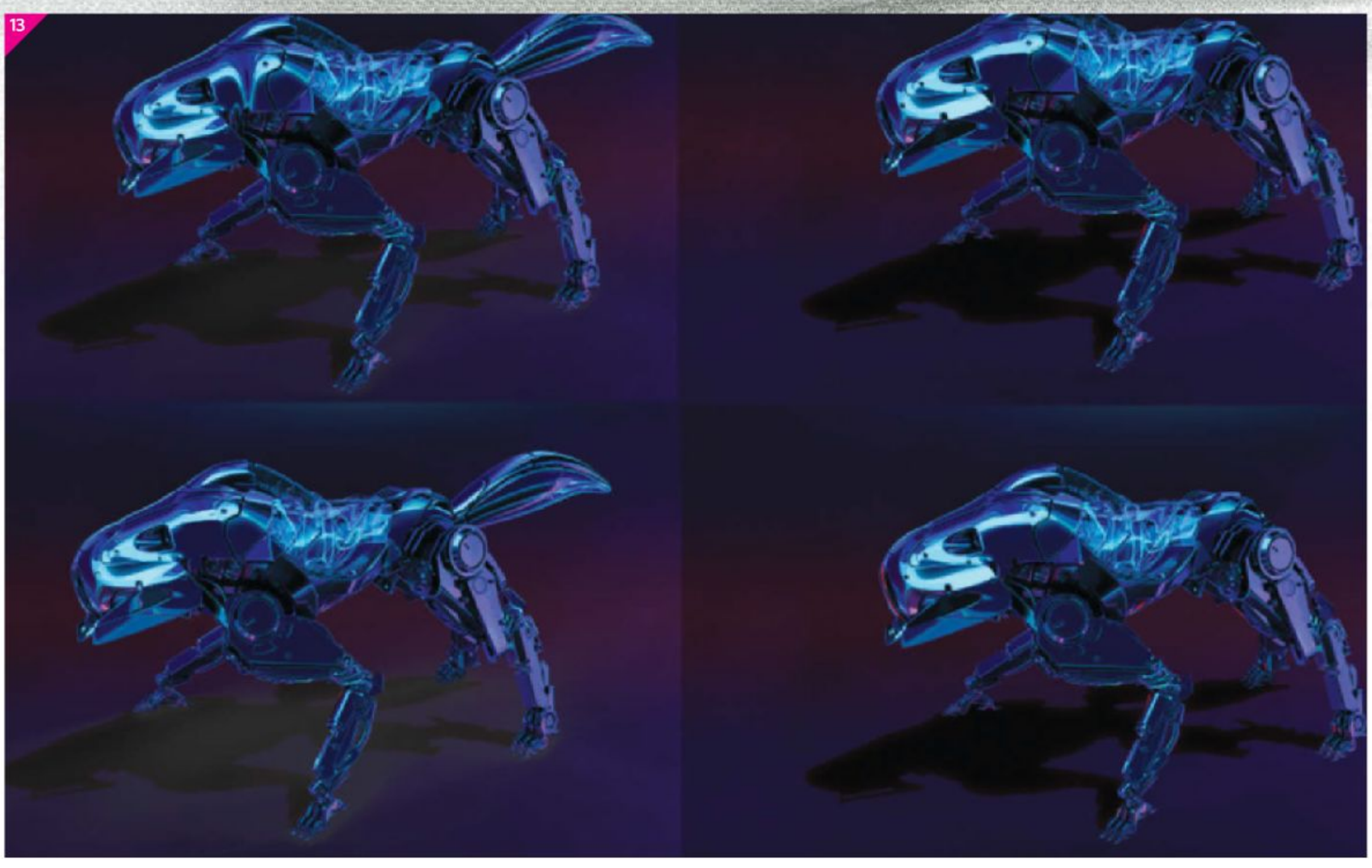


11 Render in KeyShot You should always ask yourself at every stage what you expect at the end and what your task was. In terms of rendering, we first sent the files to KeyShot and tried to make a classic hobo robot by combining passes, but we felt that this was not enough originality and we had to look for a fresh look and feel.

12 Retro Eighties look So now we set the HDRI in KeyShot and modified it with an integrated HDRI editor. We placed lights by referring to different pictures found on the Web. We then set a metal material for all the parts and set the cloth as a glass material. The glowing eye is a emissive shader with a simple red colour. Now simply render it.







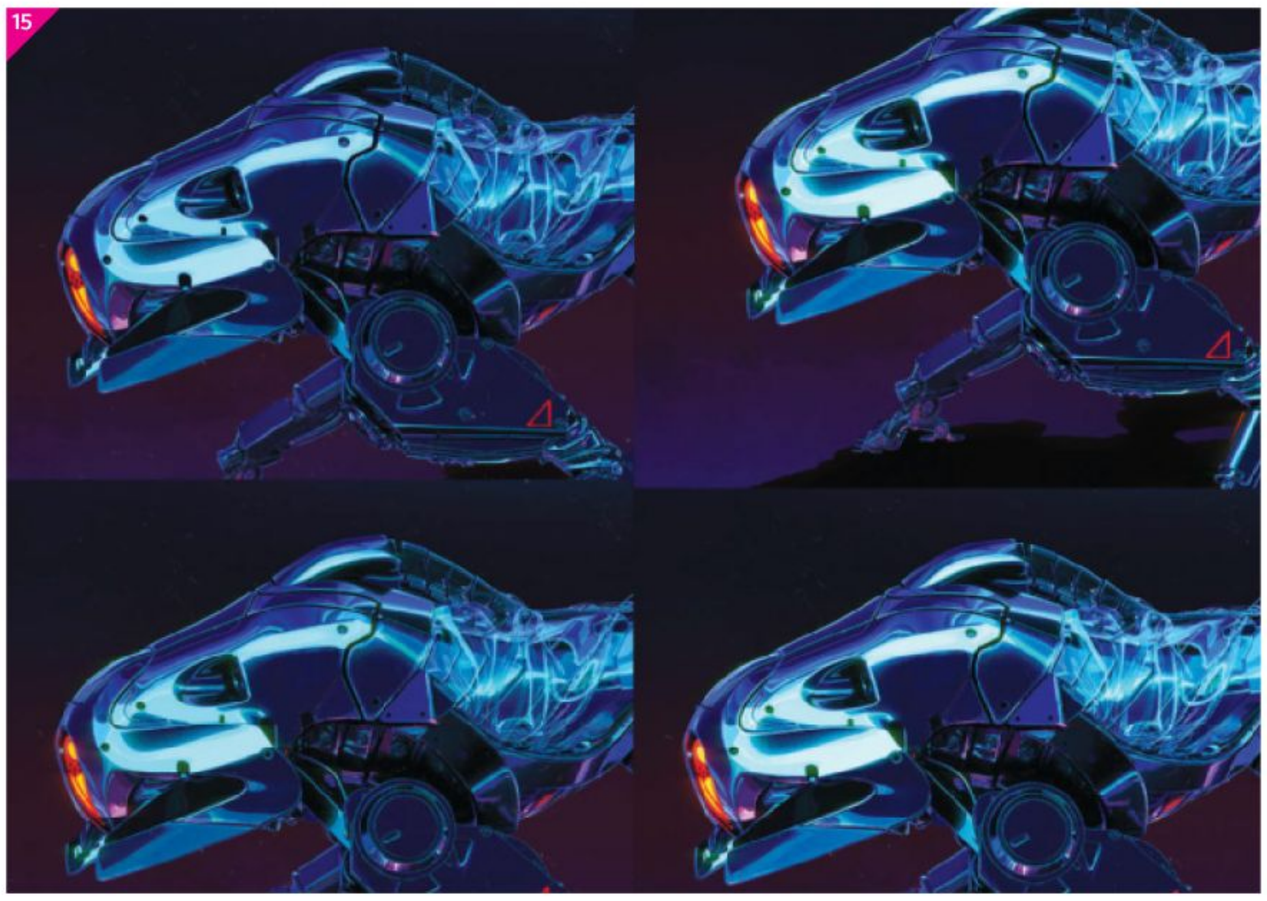
13 **Painting** Using the render as a guide, select Gradient Paint brush and repaint every reflection to bring the artistic touch into a 'dead' 3D render and fix issues with surfaces. Find a good colour and place soft highlights to magnify the overall look.

Do not stop to design

Even in the final stages try to think as a 2D artist in 3D. Sculpt your volumes with light and shadow. Find a good contrast between values and force your reflections to describe a shape as lines rather than random spots. Keep the surface clear and easy to read. Also make the viewer follow the picture with your own scenario and tell him or her where to concentrate and where to run fast. Design the mood as a part of the whole thing by incorporating various colour injections into the final picture.

14 Kitbash the design and add FX Now put some more life into the image. The best way to do this is to use a Soft brush and a Color Dodge layer. Slightly paint glow effects on the eye then duplicate the layer. Gaussian blur is a good starting filter, and it is important to follow the eye using colour and value spots on the image. Try to emphasise the feel of light on the image and add depth by controlling the light balance on the image. After that detach some parts from the image and place them in the right spots.

15



15 Postproduction work in Photoshop The magic in the image usually happens when you are free to add cinematic effects. The Curves command is good to start with to bring the light values. After this, our favourite trick is to use Magic Bullet software. Start with a slight diffusion with colour – it will blur the image much like how a photo taken on a camera would look – and try to put in some really soft bloom effects using atmospheric flares. Painting with the Dodge tool will help to light the background.

17 Final details Merge all the layers into a single one. Use lens aberrations as a small colour shifter. Clamp the colour and use a monochromatic noise layer. Take some smoke and paint it as a soft colour dodge or screen layer. Sharpen the image and maybe fix some mistakes manually again. Now you should be finished!

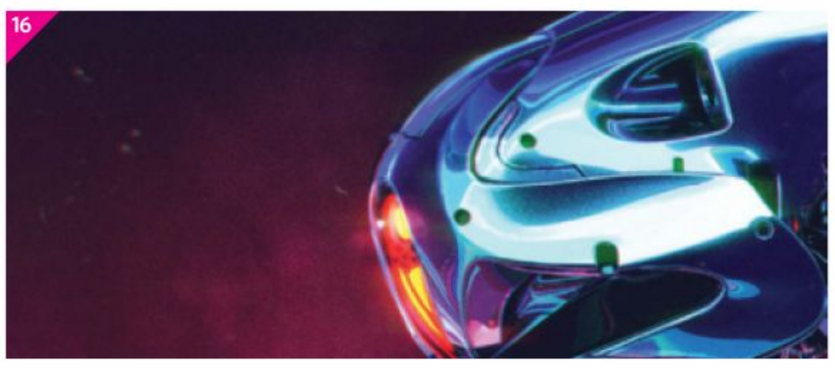
14

Kitbash as hard as you can

Every time you create artwork you will need to find a balance between speed and quality. It will be good for you if you can dedicate your time to learning new ways for improving your workflow. We are able to communicate through less volumes than vertex manipulations. This way we are able to create bashing kits faster and optimise them for our purposes in less time. Always try to make the kit as simple as possible so it fits in with different environments and styles.

16 Deep FX layers This stage means adding dust and scratch textures to the image and it is a very cool trick which helps the render look more realistic and close to a real camera shot. Each texture should be used softly in this way so the viewer will feel more and will believe in the story you are telling with your image.

16



17

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Software

3ds Max, V-Ray, Photoshop

Learn how to

- Make a comic image with VRayToon rendering
- Add diversity to VRayToon outline widths
- Use Photoshop filters to make the image interesting
- Bring a comic-style effect to rendered scenes

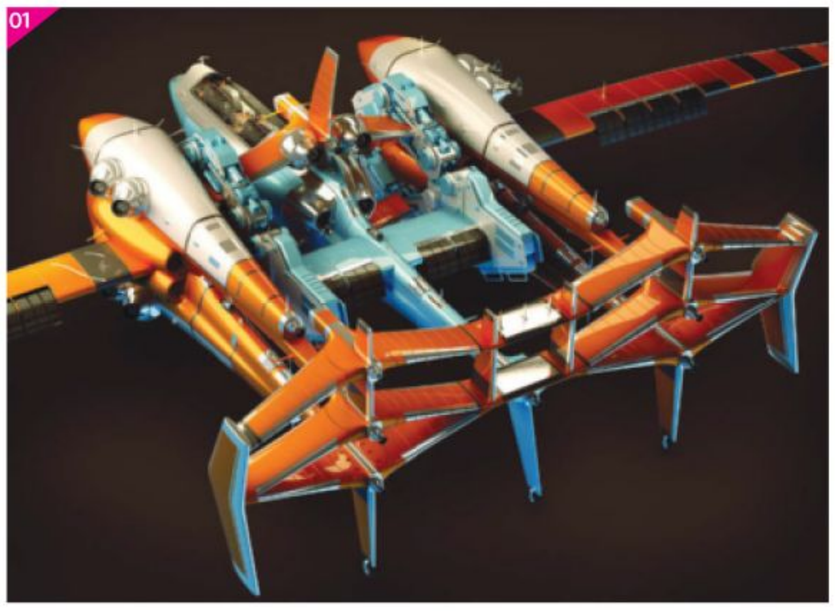
Concept

Take a Lockheed P-38 Lighting as your reference for creating a lightweight patrol aircraft, which has distinctive twin booms and a central cockpit. It is used as a short distance patrol aircraft in the story and can carry two pilots maximum.

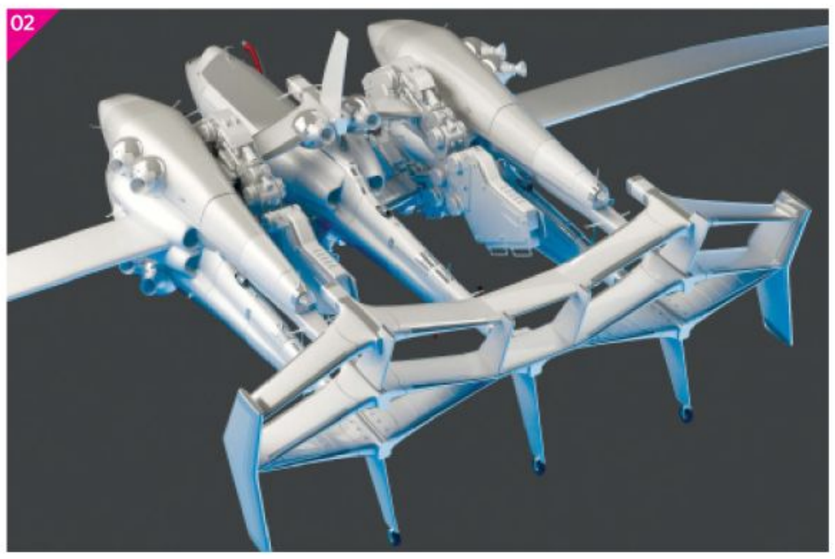
Create comic book style renders

Use 3ds Max and VRayToon to visualise an aircraft concept and bring it into a virtual comic strip world

In this tutorial, 3ds Max and VRayToon will be used to teach readers how to render in a comic book style. We will use multiple VRayToon outline settings and also make the image much more interesting by adding layers with Photoshop filters. Without rendering, the difficult part is to find other interesting details for the image without losing the main focus. After all, you can't make a good image without a focal point, so here we have to use the minimal elements to create the excitement and vitality for the scene. The tutorial starts from the aircraft itself then extends into the environment surrounding the aircraft.



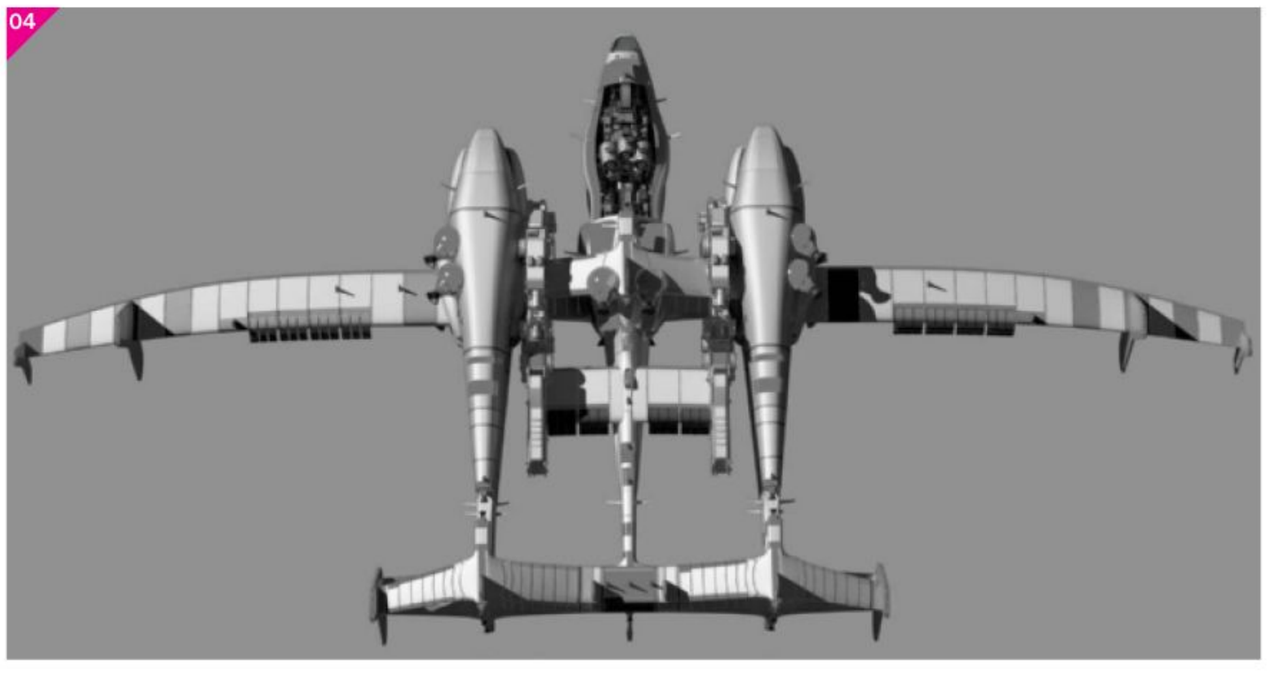
01 Start with an original concept The lightweight aircraft was created for the first chapter of the comic *BPI: Blue Patrol Industrial*. This is the vehicle for bringing the main character into the world. To make it more realistic, it contains a lot of functional elements for both the exterior and interior. The original concept has colours and a realistic V-Ray render. The challenge here is to bring this to a comic book style but still keep the excitement for these important assets.



02 Apply the simple grey materials It is so much easier to start with an empty sheet for a new style because it gives less distraction. It is a bit scary to start from nothing but it is definitely the most effective way to kick in. I took the concept models and applied a few grey default V-Ray materials. Some of them are reflective and some of them have a bit of a darker grey colour.

03 Make a few differently toned materials Now we use a range of greys, with some greys more intense than others. We also add an engineering shade of orange into the aircraft to bring in a bit of excitement. We only add in one more colour here; if we make it too complicated it will kill the simplicity of the comic style we want to achieve.

04 Start applying multimaterials We've applied six materials to the models, and the comics usually use only a few simple tones to completed images. Here we keep orange for the character suit as the character needs to be the camera focus, so it needs to have more visibility and to be the focal point. Using the remaining five colours, play around with different portions and combinations for the best balance.



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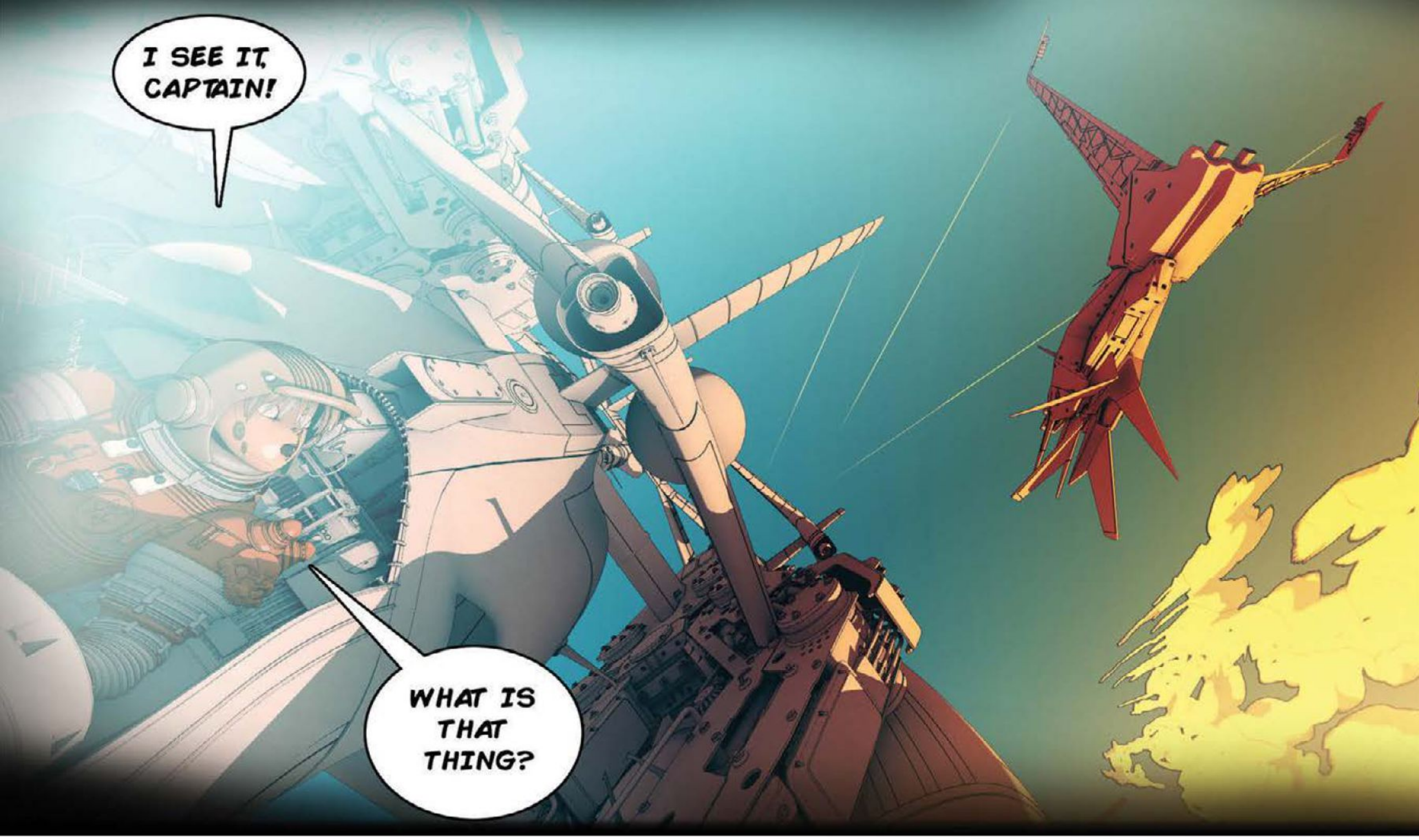
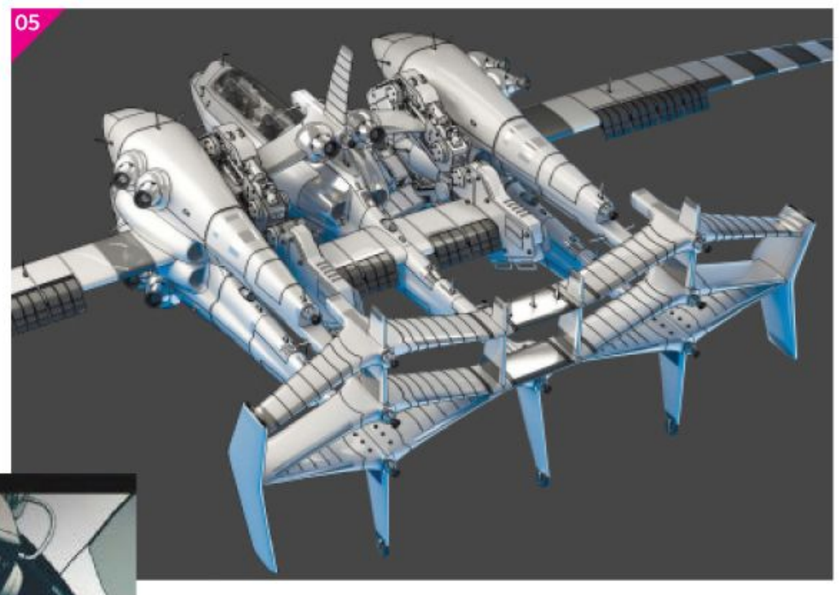
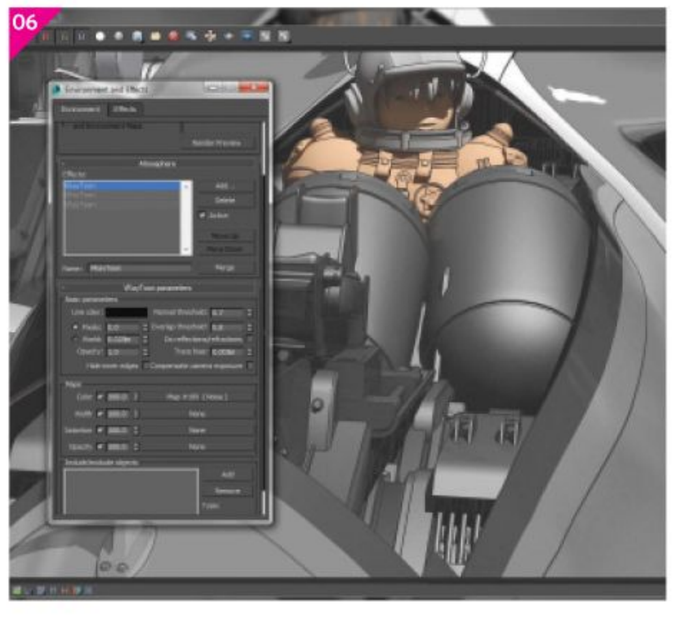


05 Turn on VRayToon render With VRayToon render on, we now also have the outlines around the models. It gives the models the right kind of comic look. However, if we compare this to a cartoon production, the outlines here are a bit boring. This is because they all have the same width. If this is the only big object in the scene then that could be really dry for the viewer's eyes.

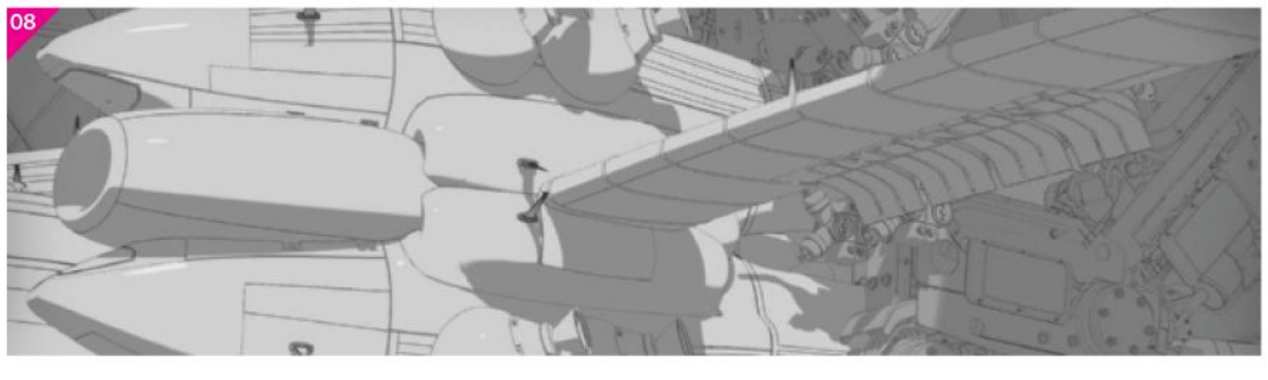


06 Play with line width To make it more interesting, we need to give it a different width for different objects. Create more than one setting for VRayToon, this way they can hold different settings for the different groups. For example, you can use less obvious lines for background elements and use stronger lines for the area that is nearer the focal point.

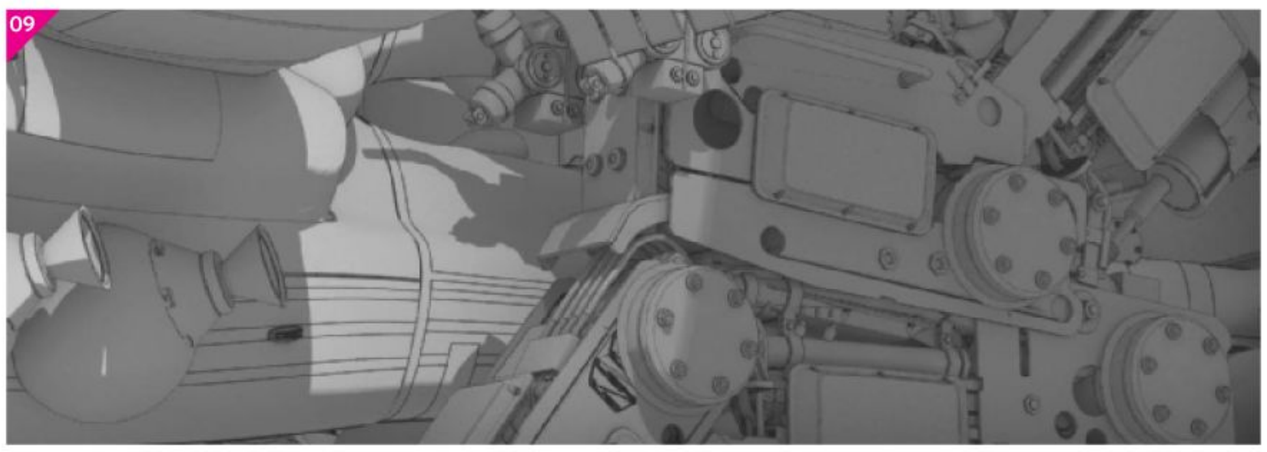
07 Play with strong lights With all the different line groups set up, we now have more visual variety. The background elements were pushed back and the focal point now lands on the character area. However, if there is no light there is no life. Lighting does play a very big part in a good image. Here we placed a strong sunlight and made sure the edge of the shadow lay on the character's face, so there will be a main focal point for this image.



08 Take a comic scene as an example Here we took a comic scene to show how we turned it into a comic-style page. This is an aircraft launch scene, the patrol aircraft is going to be launched through the catapult. First, use the same VRayToon outline setting from Step 1 to apply to all elements and make sure the lighting has been put into the best place so it can cast a good shadow and make a good focal point. The area near the middle left in our image is the focus.



09 Add AO This vehicle is for a comic style, we should keep it flat looking. However, since we made all of this in 3D, there is no reason to not take advantage of 3D software. We took the same models and rendered out their AO, known as ambient occlusion. If you are a V-Ray user, there is a handy script called Vray Ambient Occlusion by **populate3d.com**.

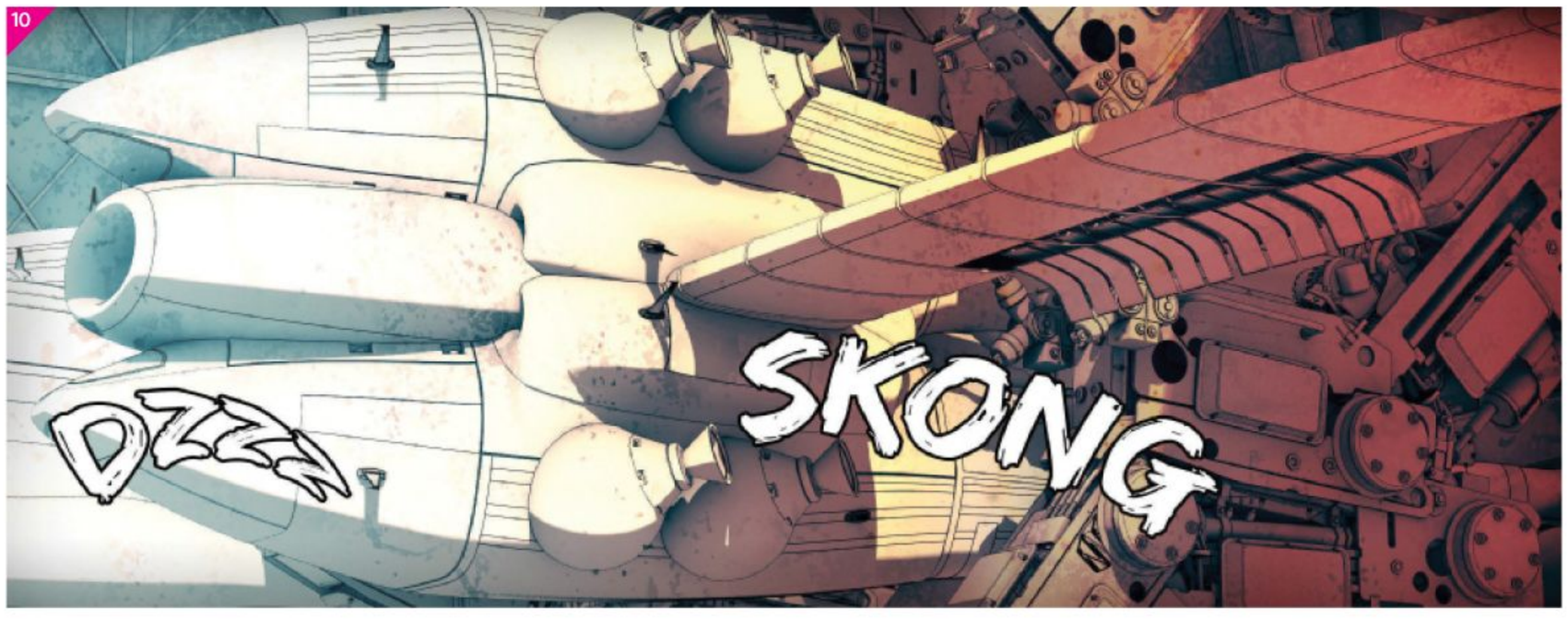


Liven up the scene

After setting up a basic VRayToon, we now have the beautiful toon shader lines around the 3D models. we started to focus on how to bring life into the scene. To make it feel more humanistic, we can add more human details into it that can be dirt, noise, graffiti and so on. The strongest element you can use is lighting. Good lighting can give a scene new life or even bring it some drama that can help storytelling and build up the character's personality. Here we are going to use a bit of 3D software help to get an AO pass. Then we use Photoshop filters to help make different focal points across different cases.

10 Add details with Photoshop filters

After applying an AO render in Photoshop's layer with multiply, start to add more dirt and noise details into the scene. To make it more interesting, apply more Photoshop filters – one on the left side of the image to make the lighting stronger and another one on the right-hand side of the image to add a red tone to create more contrast in the image.



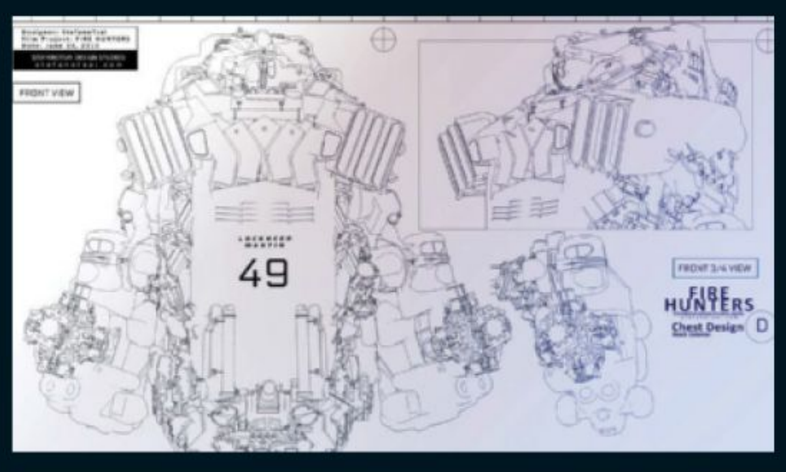
Showcase

Stefano Tsai

Stefano is a concept artist, a designer, a dream machine and virtual environment builder living in the UK. He loves everything about details and has dedicated his life to this since he was a child. He enjoys the process of bringing concepts to life.

***FireHunter Set Concept*, Photoshop, 3ds Max (2015)**
A concept for the short animation 'Fire Hunters'. This is the concept for a lower street set with a lot of steam, machinery and advertisement boards going on and also some futuristic vehicles mixed with old, classic vehicles.

***FireHunter Mech Cockpit Interior*, Photoshop, 3ds Max, (2015)**
Another concept for the short animation 'Fire Hunters' – the concept for the cockpit of the mech. After trying a few versions of it, this is the one that I love the most.



***FireHunter Mech Cockpit Exterior*, Photoshop, 3dmax, (2015)**
This is an exterior mech concept for the short animation 'Fire Hunters'. It is the chest section, but you also can see the arms. This is the mech for the main character.

11 Make the interior shot The space is quite narrow for placing a camera for a special cabin scene. To make it work, you can either create a wide-angle camera or create a cross-section scene for the shot. We've chosen the latter and cut some panels off to make the shot possible. This also added more details for the scene and helps to show the depth of the story and believability of the aircraft.

12 Make a medium shot in the clouds For a medium shot, make the VRayToon lines much lighter and thinner. You can also add more environment colours into layers to help the aircraft to blend into the scene. To make it interesting, add a strong light on the left side to ease some attention and on the right side add a red tone colour filter to push the eye's focus to the centre of the image. We made the background terrain much darker so that it will not fight with the aircraft.

13 Make a distance shot For a distance shot, sometimes you need to turn off VRayToon render to avoid the line noise on small objects. Here the aircraft becomes small, almost like a dot. If we apply VRayToon to the aircraft, it will become too noisy and jump right to the front. However, we need it to be pushed to the background, so in this case, we turned off its toon shader, but the rest of the elements are kept the same. To create less interference, you can use a pure black material for some ground level elements, so that again the focus now lies with the aircraft.

11
How's the view of the Outer Zone today, Lieutenant?
Empty and lifeless as always, Captain. Sometimes it's hard to imagine this place used to be inhabited.

Simplicity is best

I really like the movies created by Mamoru Oshii, Katsuhiro Otomo and Hayao Miyazaki. They have the true blood of Japanese animation – a visual feast of mechanical design. The concepts in these movies are just so inspirational for artists. However, when you have started learning from their work, you should find that the truth behind all of the complicated mechanical and set design is 'simplicity'. That is, the magic of cartoon and comic. No matter how complex those design are they will be united by art director eyes and harmonised by colours, lighting, mood – most importantly the final result is always so easy to watch and understand so that you feel the simplicity, energy and love put in.

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DAMON WOODS
Pep Rally, 2015

Software

ZBrush, 3ds Max, Marvelous Designer, Photoshop, KeyShot 5

Learn how to

- Design a visually interesting character
- Block in details from large to small
- Use the Insert Multi Mesh and Curve brushes to your advantage
- Create realistic cloth folds with Marvelous Designer
- Use techniques for creating hair, eyebrows and eyelashes quickly in ZBrush
- Create skin details
- Get great results with KeyShot shaders
- Learn tricks for setting up good-looking lighting scenes up in KeyShot
- Set a camera in KeyShot
- Find the best render settings for KeyShot

Concept

The first step as part of any workflow is having a concept. I start by sketching out my character, making sure that the details and forms are clear. This saves a lot of time down the road.

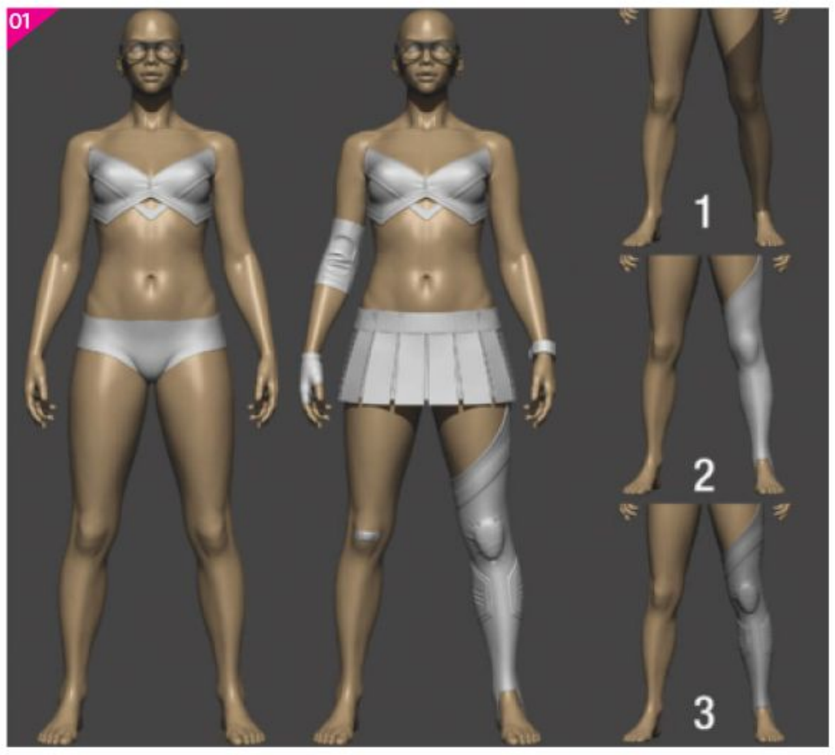
Render a cyberpunk character

Model, texture and light a high school student from start to finish for a futuristic cyberpunk world

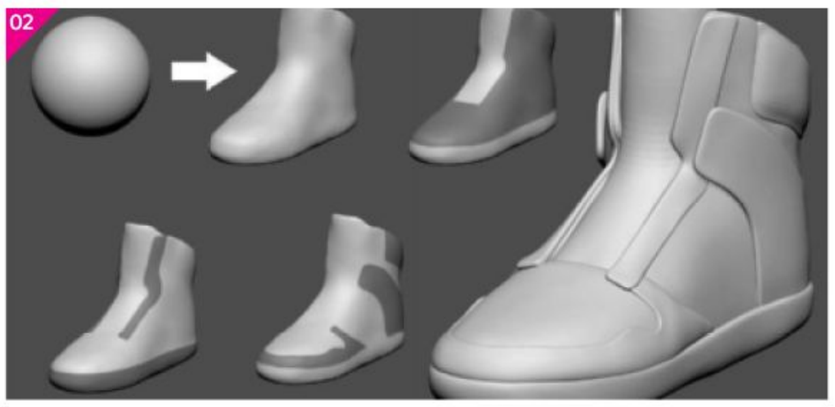
Today, we're going to learn how to create a rebellious cyberpunk teenager from the not-so-distant future. The inspiration for this character came from a love of sci-fi and nostalgia for high school sports culture. The mixing of genres is a great way to explore new avenues for design. In this tutorial, you'll learn how to take an image from 2D sketch to a fully realised piece. We will accomplish this with a variety of tools including ZBrush, 3ds Max, Marvelous Designer, Photoshop and KeyShot 5.

Whether you're an interested hobbyist, or an industry pro looking to learn a few new tricks, this step by step will show you how to take your work to the next level.

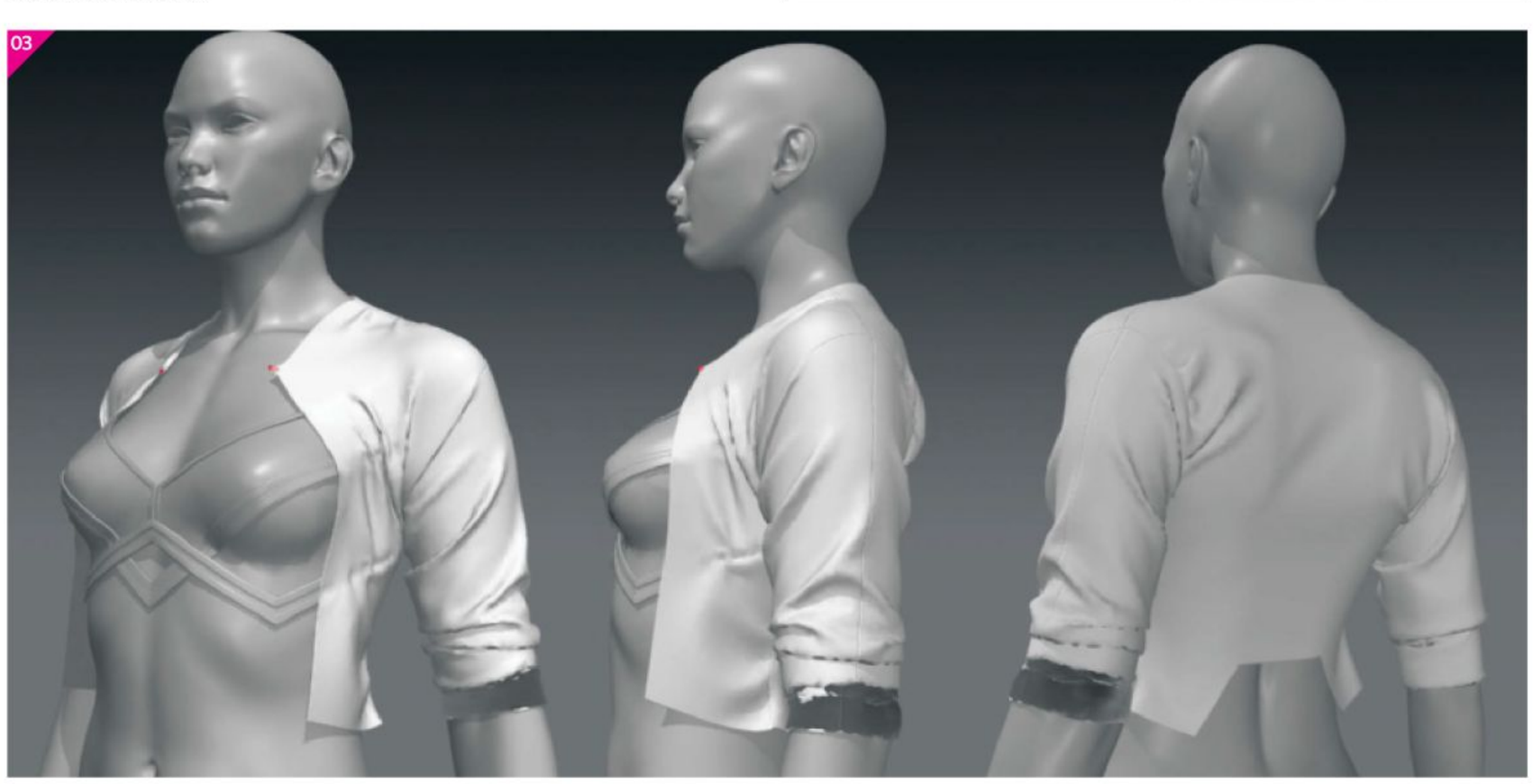
01 Start at the basics In building up a character, it's effective to start at the most skin-tight items and work your way outwards. This helps us build a well-fitting outfit and helps reduce geopenetration issues down the road. The skin-tight accessories were created by masking out the shape of the clothing on the body and then using extraction. The skirt and glasses were created in 3ds Max.



02 Shape the shoes Trainers, like most footwear, are simply a compilation of flat leather shapes. To make the shoes, use a DynaMeshed sphere and shape it around the foot. Then subdivide it a few times and create the different leather patches that make up the pattern of the shoe using the same mask and extract method as Step 1. Feel free to use real-life trainers as reference.



03 Use sim to create cloth We want the jacket to have some nice realistic folds on the sleeves. A talented artist could probably sculpt some pretty believable folds, but they will never be able to match the speed and accuracy that a cloth sim program can provide. Using Marvelous Designer, we can create this jacket with a few well-placed shapes. At this point, you don't need to nail every single wrinkle. We just need a good foundation to start on. When you're all done, make sure to set your particle distance down to around 3. Then, export as an OBJ to bring back into ZBrush.



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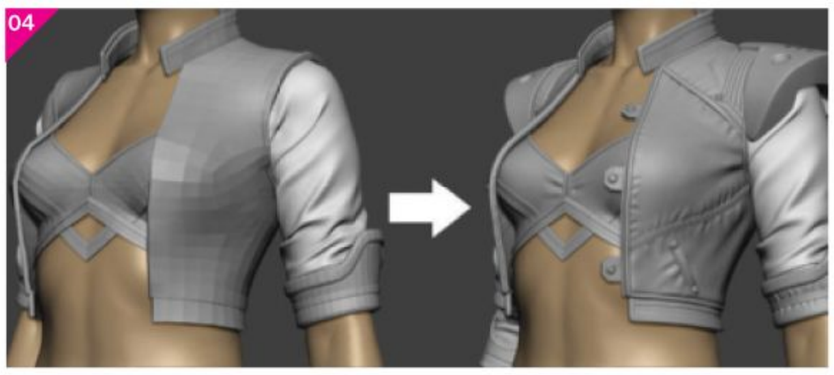
"The skin-tight accessories were created by masking out the shape of the clothing on the body and then using extraction"

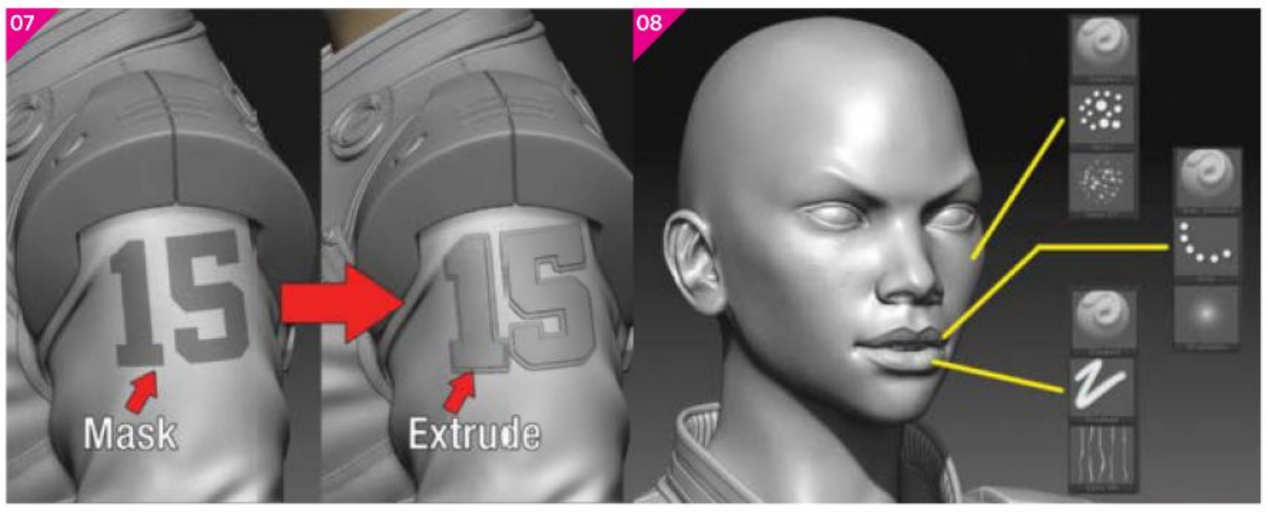
04 Touch up the cloth Now that you have a solid base to work on from Marvelous Designer, go in and add the smaller winkles and irregularities to the mesh that we see in everyday life. Once again reference is key. Pay close attention to the way the cloth buckles and ripples around seam lines. Pay attention to the natural direction that the sim cloth flows and add additional folds in places that look a bit bare. The collar, straps and other pieces were created with the CurveStrapSnap brush and touched up in 3ds Max.



05 Add seams and stitches To add stitches, create a custom Curve brush with a simple piece of geo to repeat. Making sure that Curves mode is on, start adding your stitches to the areas around the edges of your clothing and anywhere that patches are joined. As an additional detail, use the Dam_Standard brush to slightly indent the path of the stitches. To create the seams on the jacket, use the CurveStrapSnap brush.

06 Add nuts and bolts To add the nuts and bolts that give our character a better sci-fi feel, we will use the IMM (Insert Multi Mesh) Brushes. Select the IMM_ModelKit brush and then hit M on your keyboard. This will pull up all of the various shapes and objects for you to choose from. To add the shape, simple click and drag on the object.

07 Create the patches Our hero is an accomplished athlete and she's not shy about it. To adorn her with her various patches, we first created some custom Alphas in Photoshop. Then we import them into the Alpha palette and do a mask extract like before. These meshes can get pretty heavy, so we suggest hitting them with ZRemesher.

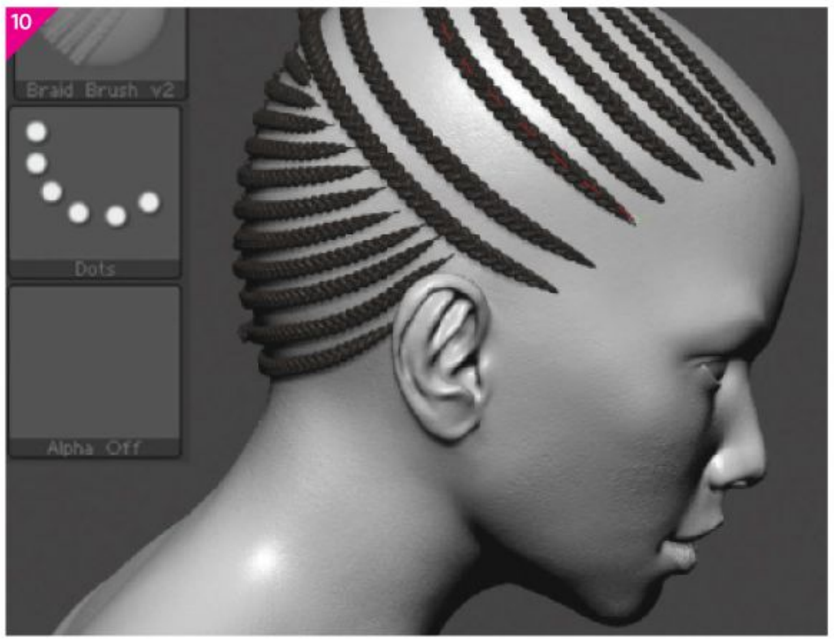


08 Facial details Adding details to the face needs to be very precise. Make sure you have plenty of reference that matches the type of character that we want to convey. Sculpt what you see and not what you know. Reference is key in creating a believable piece. In this case, our character is high school age with attractive features. Alpha 07, with Spray mode on and at an intensity of around 6, is ideal for adding skin pores. Pay close attention to your reference to see what size, direction, and depth the pores are going in. Use Alpha 58 with Stroke mode on to create the subtle lines under the eyes and on the lips.

Size matters

When starting a project, pay attention to the real-world scale of your character. In 3ds Max or Maya, use the measuring tools to make sure your character is a realistic height. Programs like Marvelous Designer and KeyShot use real-world scale to calculate things like gravity and thickness. If your character is 70 feet tall or the size of an ant, it will have an adverse effect on your final results.

09 Create hair To create the curly 'frohawk', simply mask the area along the top of her head and go to the Fibers tab in Lightbox. Select Curley_Hair1.ZFP. From there, go into the FiberMesh tab and hit Preview. From here, you can adjust all of the parameters of the hair. You can see the settings that were used for this piece. Once you're satisfied, hit Accept. The eyebrows were created the same way. Just mask off the eyebrow shape, use a straighter hairstyle like Fibers160.ZFP and lower the length and fibre count accordingly.



10 Add the braids The braids were created using a custom Curve brush graciously donated to the ZBrush community by Tetsuo Oshima. Draw the braids across the head one at a time and adjust with the Move brush. By nature, the Curve brush will add the braids to the same SubTool that you are drawing on. A quick way to separate them is to clear your masks, then Cmd/Ctrl+Shift+click the head to isolate it. Mask the head completely and then Cmd/Ctrl+Shift+click in a blank space to unhide everything. Now with the head masked off from the braids go to Subtool>Split>Split Masked Points.

Add eyelashes

Everyone has eyelashes, but not every artist remembers to add them. The Curve brush can be used to quickly and effectively create eyelashes. First model out a single lash and then orient the camera so that you are looking at it from the tip. Go into the brushes palette and select 'Create Insert Mesh'. Turn on Curves mode and draw along the edge of the eyelid. Keep in mind that the upper eyelashes are fuller than the bottom ones.

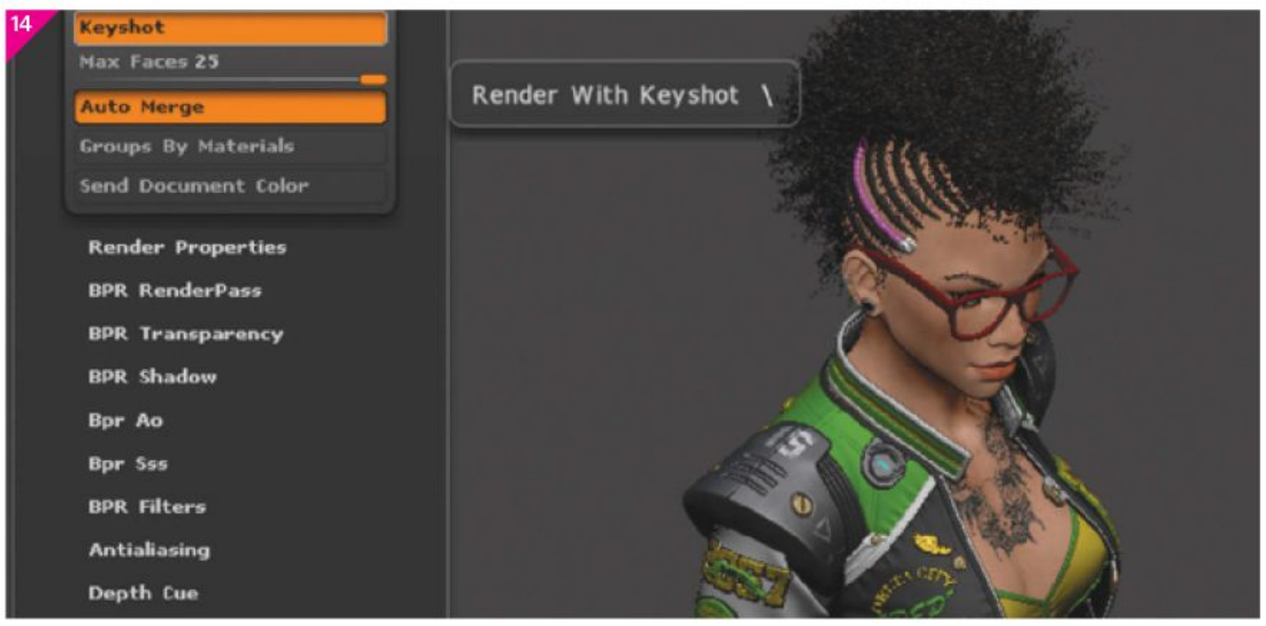
11 Block it all in Just like in the modelling phase, we first want to block in all of the colours with flat colours. To do a fill, go to the Color tab at the top of your screen and hit FillObject. Make sure that Mrgb is selected and use a basic material for now. The school colours for her are green, black and gold. Using lots of reference of athletic apparel, we can get a feel for how to approach things. The goal is to make her outfit read as a high school uniform, no matter what time period it is set in. The clothes would be clean, colorful and well maintained with different types of materials mixed in.

12 Texture the skin Using the same skin colour that we used as the fill, select Alpha 7 with Spray mode turned on. Make sure to turn off Zadd and Zsub so you aren't sculpting while you paint. Now lightly brush across the surface to add some irregularity to her skin tone. You can also go back in and add smaller things like birthmarks and acne scars. Remember, nobody is perfect and small skin irregularities really help add realism to skin texture. To add the tattoos, images were turned into Alphas and added with Drag mode. Use a dark green colour instead of pure black to give the tattoos a more realistic tone.

> Go through and assign materials to all of the different pieces to help add another level of detail

13 Assign materials Now go through and assign materials to all of the different pieces to help add another level of detail. With M selected, select different materials from your Materials palette. To do this, select the SubTool and do a fill the same way we added the colour. ZMetal was used for things like nuts, bolts and zippers. Skin shader 4 was used for skin. Basic material was used for cloth.

14 Export the geo into KeyShot We'll be using KeyShot 5 to do our rendering. The ZBrush Bridge in 4R7 lets us zap our model and materials right over to KeyShot with the click of a button. Just go to Render>External Renderer and hit the KeyShot button. Now when you hit the BPR button it will automatically launch KeyShot and send over all visible geo.



What's in a label?

Adding text and labels is a great way to add another level of detail. In modern times, almost everything comes with instructions. We're so used to seeing labels and logos on things that we don't even notice them until they're gone. Create some interesting logos and labels and place them thoughtfully throughout your piece. Even something as simple as a serial number can add that extra graphical punch to your artwork.

Showcase

Damon 'DK' Woods

My name is Damon 'DK' Woods and I make next-gen game characters. Currently, I'm a professional character artist in the videogame and VFX industry. I'm also a character art instructor at the CGMA Academy.

***Indi Girl*, ZBrush, 3ds Max, V-Ray (2011)**
A female bust that I did a while back. It reflects my love for unconventional beauties who go against the grain. Inspired after watching the film *The Girl With The Dragon Tattoo*.

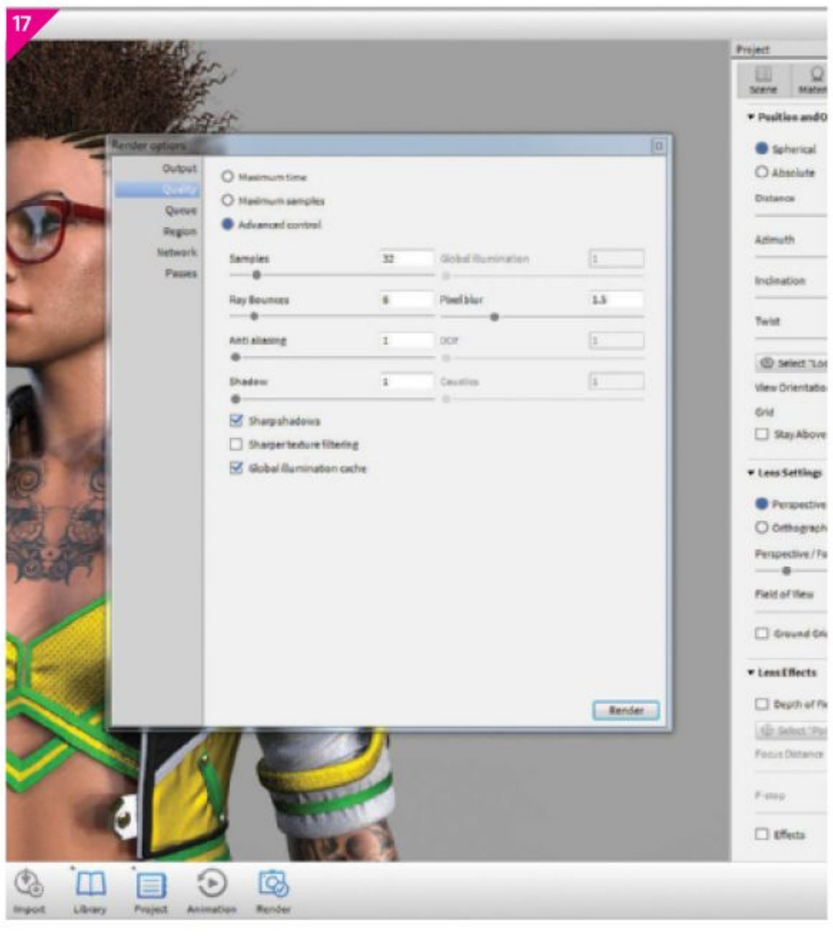
***Mr Liu*, ZBrush, (2012)**
This was created as a life study. The man's name is Mr Liu and I thought he just had an interesting face with lots of history in it.

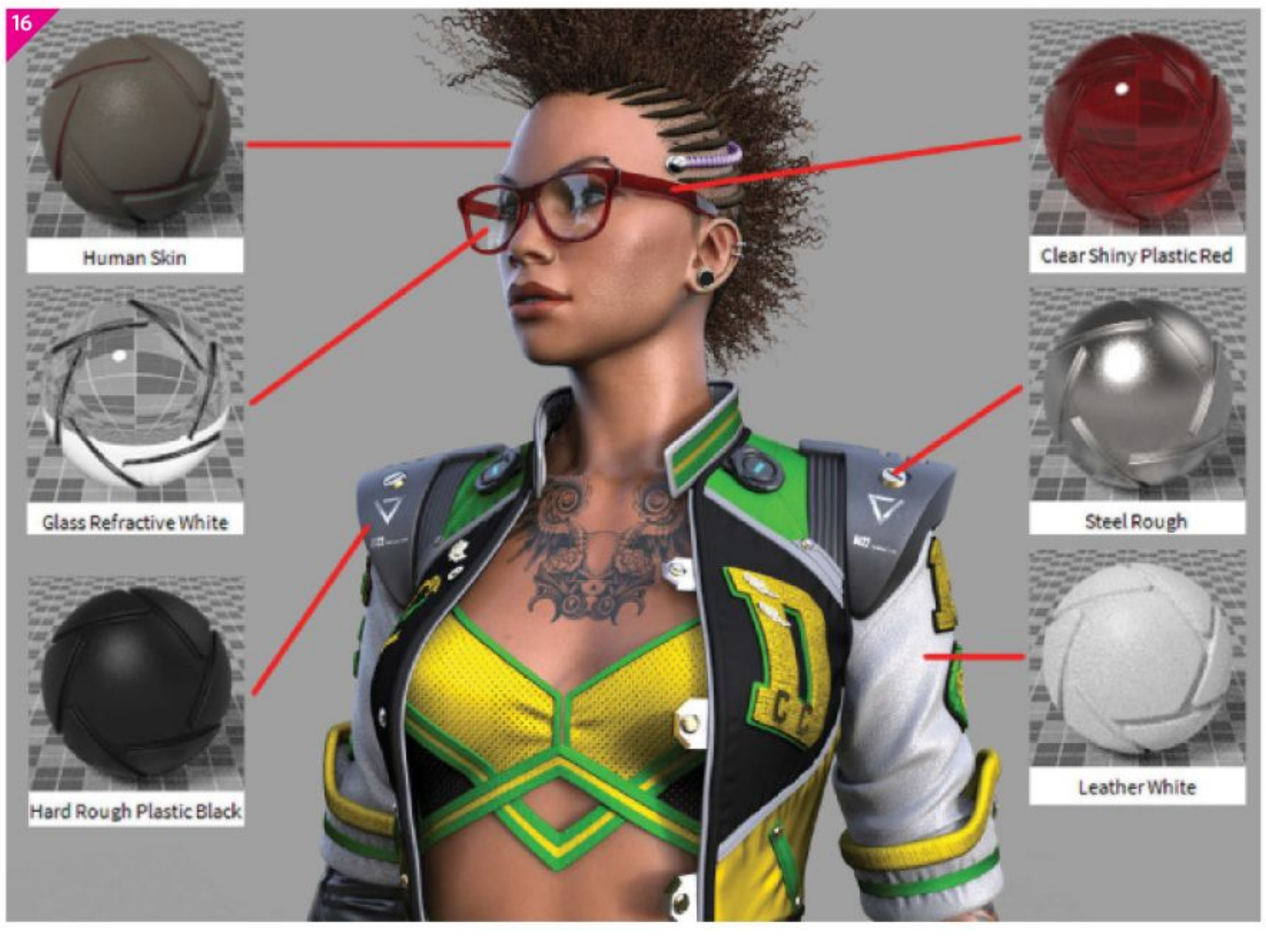
***Late Night Bite*, ZBrush, KeyShot, (2014)**
This was one of my first times using KeyShot. I'm a fan of vampire movies and figured I would put that love into this piece.

15 Set up lights When you have all of your geo exported to KeyShot, you will always be placed in the default studio scene. The first thing you might notice is that the lighting looks really flat and uninteresting. Let's change that by setting up a scene of our own. Go into Environments under the Library tab on the left and select an HDRI scene that you like. For this tutorial, we used the Outdoor>ForestRoad scene. Now go into Environment under the Project tab. Click Edit HDRI and from here you can make several adjustments to your piece like Saturation, Hue, Brightness and Contrast. To adjust the light direction, just use the rotation wheel. You can hide the background image by clicking the Color box under Background and choosing a less distracting neutral colour.

16 Adjust materials Once you've created a lighting setup that you like, we can adjust our materials in the scene. KeyShot will automatically assign materials based on what you assigned in ZBrush. But some of these materials may not be what you want. To assign a different material, click the Materials tab under Library on the left. Here, you can choose from the huge selection of materials that KeyShot has. Simply drag and drop the material over the piece of geo to assign it. To preserve your textures, hold Opt/Alt while you do this. The materials also have a great selection of normal and transparency maps. We used the dots textures to create the mesh materials by going to the Textures tab, clicking the bump and opacity boxes, clicking the dropdown next to Texture type and selecting Texture map. Then select the Dots map for the bump and opacity.

17 Final render settings Once you're happy with the way your materials are looking in the scene, find a good camera angle and save that camera by going to Camera>Add camera. Then click the Camera tab on the right. Here you can make adjustments to things like focal length, FOV and even add lens effects like depth of field or bloom. Once you've finalised your camera, hit Cmd/Ctrl+P or navigate to the Render tab. For best results, we recommend setting the samples to at least 32 and choosing a file type that supports Alpha. Click the box that says Include Alpha, set the file size and destination to your liking and hit the Render button. Congrats, you're done!





Add lights

Are the HDRI scenes not cutting it for you? Take matters into your own hands and add some lights of your own. Go to Environment>Edit HDRI and then click the Pins tab. Click the Add Pins button and a circle will appear on the HDRI map indicating the position of the new light. You move the light around by clicking and dragging it and changing parameters such as hue, size and intensity. For fine-tuning the light's placement, click the Set Highlights button. Now you can drag the light across your model in real-time for precision placement. You're lighting like a pro!

All tutorial files can be downloaded from: **filesilo.co.uk/3dartist**

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Technique focus

Incredible 3D artists take us behind their artwork

LIGHTING I lit this scene using VRay Dome Light with an HDR image loaded in the texture slot. For the sunlight coming through the window I used VRaySun. The rays looked too simple, so I partly blocked them by placing trees outside of the window. This gives you the feeling that there is a full environment outside the room.

Dusan Vukcevic
vudumotion.com

3DArtistOnline username
vudumotion

Software
Cinema 4D, V-Ray, Photoshop

Industrial Bedroom, 2014

3D print a weapon from Destiny

Find out how to print objects and bring the most desirable images into real life

In this tutorial we will show you how to create and 3D print a prop from a game which will include moving parts. We will show you how to create a 3D model from simple reference images. You will learn how to create moving objects within the model and how to test them to ensure they will work in reality. You will be shown how to cut the model, create glue-free joints so that it can be assembled without any glue, and how to slice your file with the best settings to get the best out of your 3D-printed gun.

“Our rule of thumb is that with tight fits you need to put a space of 0.3mm between the bodies”

KIRBY DOWNEY
Thorn, 2014

Software
Solidworks, Cura

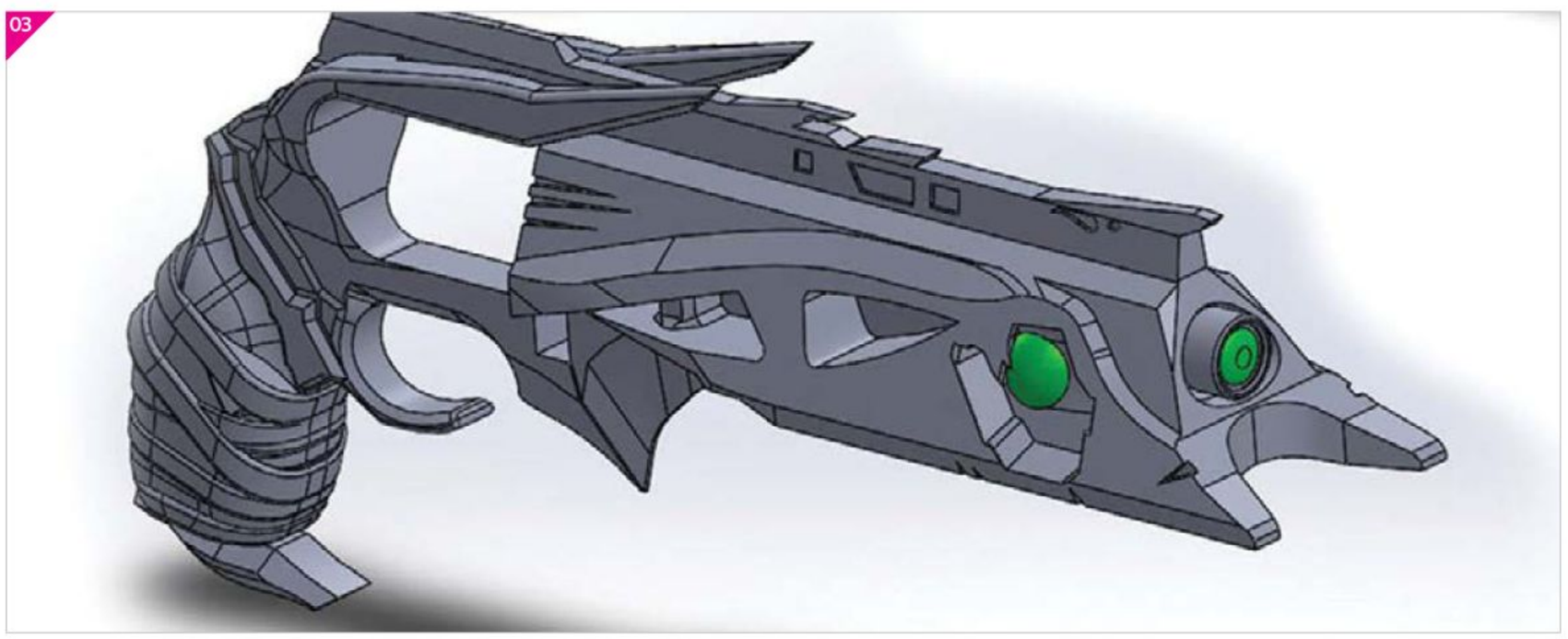
Learn how to
- Create a gun from just reference images
- Make mechanical and moving parts
- Test the mechanism
- Use tolerancing for 3D printing
- Cut the model to fit your printer
- Create glue-free joints
- Correct orientation

Concept
The purpose of this model was taking a popular gun organic from *Destiny* and bringing it to life using CAD software.

01 Use a good reference Having good reference images helps to figure out which details are necessary and which details will not come out in the actual print. Good references can establish a good sense of scale and size which will let you know how many pieces will need to be cut into.

02 Trace and shape Begin tracing and shaping the model by tracing the basic outline of the area that will contain the majority of the body, and start adding and removing material from the model to create the desired shape. All the commands used are the basic Cut and Extrude commands with fillets and chamfers to add detail.

03 Details and finishing When adding the details, you will need to keep in mind that any details that are more than one millimetre deep or overhanging will require support material. If this detail is important to the aesthetics of the model then you can add 45-degree chamfers in the detail to let it be printed support-free. Once the base model is complete you can then begin modelling the moving components within the same model.



04 Create the mechanism The mechanism is simple if you keep in mind that tolerances are required to make it work successfully. Our rule of thumb is that with tight fits like clips and joints you need to put a space of 0.3mm between the bodies. For loose fittings, like the reload mechanism, use a 0.5mm space between the bodies. This enables the chamber to move freely.

Don't waste time
There may be details that are unnecessary so don't waste time on them. Some details can be too small for the printer to capture or won't capture nicely. If you are unsure, isolate and test print that section. Some details come out better painted on or as a vinyl sticker.

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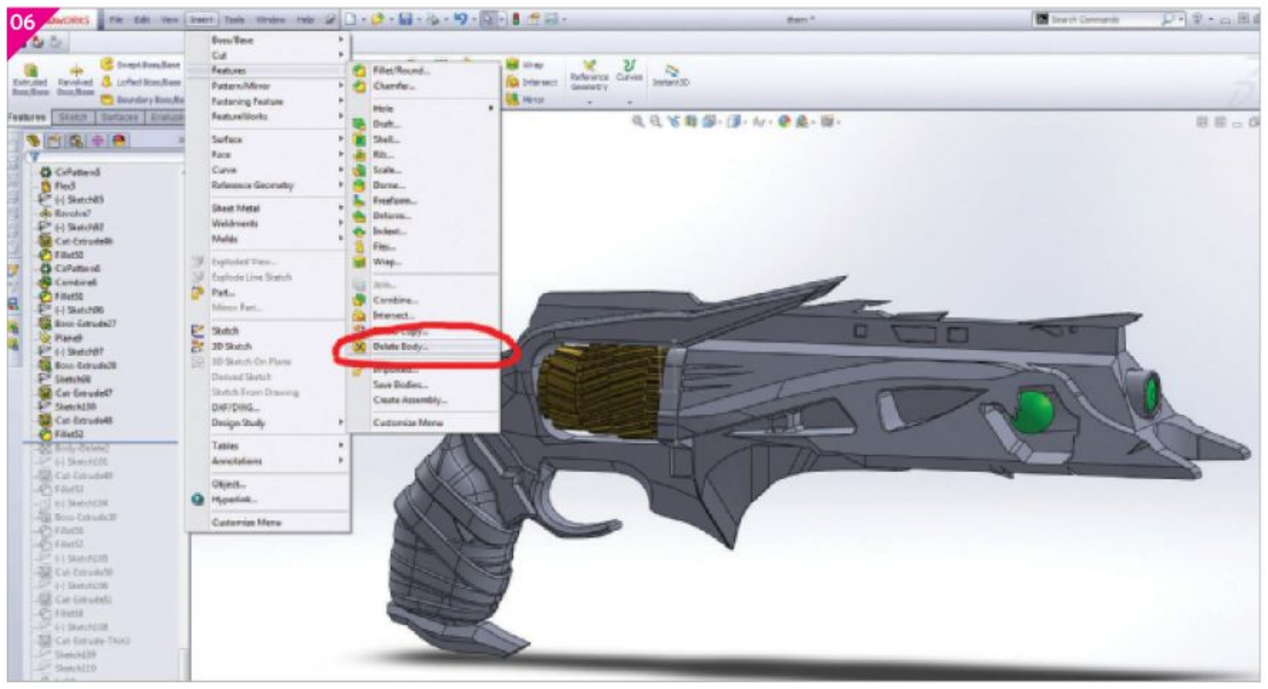
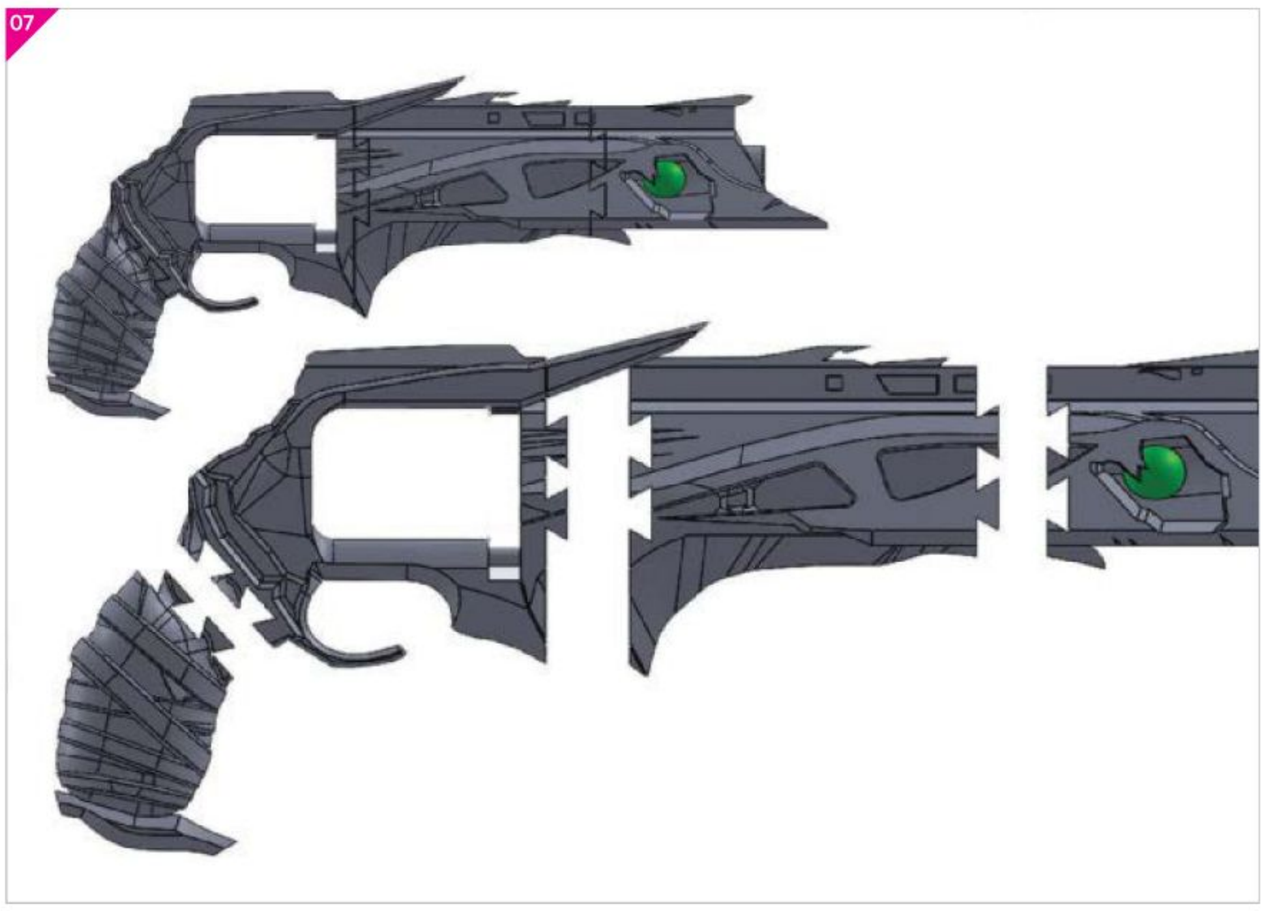
- Tutorial screenshots

05 Delete what you just did Now don't panic! This method lets you delete the bodies around the chamber and chamber mechanism so you can save them as individual parts. This is done with the Delete Body feature. This feature, found under Insert>Features>Delete Body lets you select what you don't want. Select the main body of the gun to be deleted so that you are left with the chamber. Then save it under a new name and edit the feature to select the chamber to be deleted. Save that as the original file.



06 Create an assembly Putting the parts into an assembly enables you to move the components around the environment and ensures that the chamber will not touch the body. This is important as you don't want to print this out to find that it doesn't work. If you are still unsure that it will work, isolate that section and print a prototype to test it.

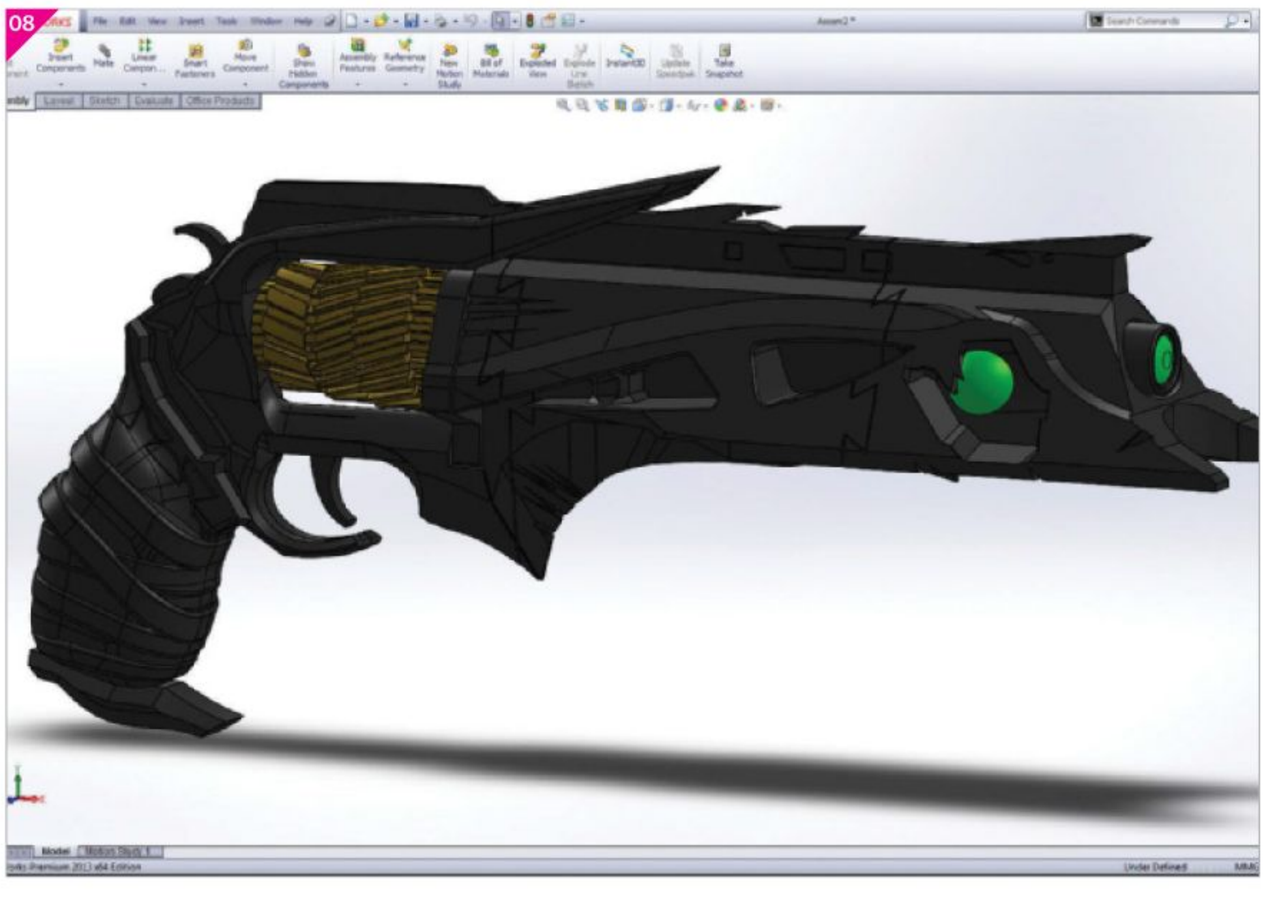


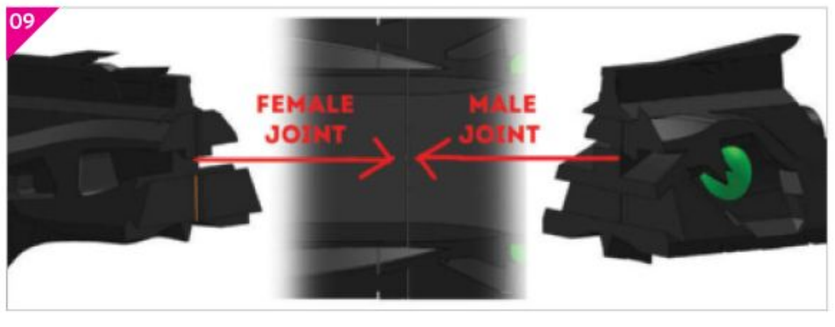
07 Slice and dice When you're satisfied with your mechanism, it's time to cut you model to fit your printer and to print efficiently. Put the size of the printer's bed you are printing on and the orientation can be in the back of your mind. The zigzag joints are designed so the model can be snapped together with no glue. We created a gap of 0.3mm for a tight fitting. Once you've cut the model, delete parts one by one to save them all as individual parts.

08 Final assembly Once you have the separate parts saved you will need to put them back together in an assembly to ensure the snap fits what you going to create and will line up perfectly.

Play with your printer

The only way you will know how you printer performs at its best and what settings work the best for it is by playing and experimenting. While modelling, if you want to see if detail will appear or if a certain section is strong enough, or if it can get away with no support, test print just that section and experiment. Once you understand how your machine can perform with certain models you can start making better models and higher detail models to properly push your machine's limit.





09 Create the snap fit This is the tricky part of the build. This involves putting in a notch which enables the parts to snap into each other. The male notch should be 0.5mm high and the female notch should be 0.7mm deep. In the image you can see a simple diagram showing the profile of the notch.

Showcase

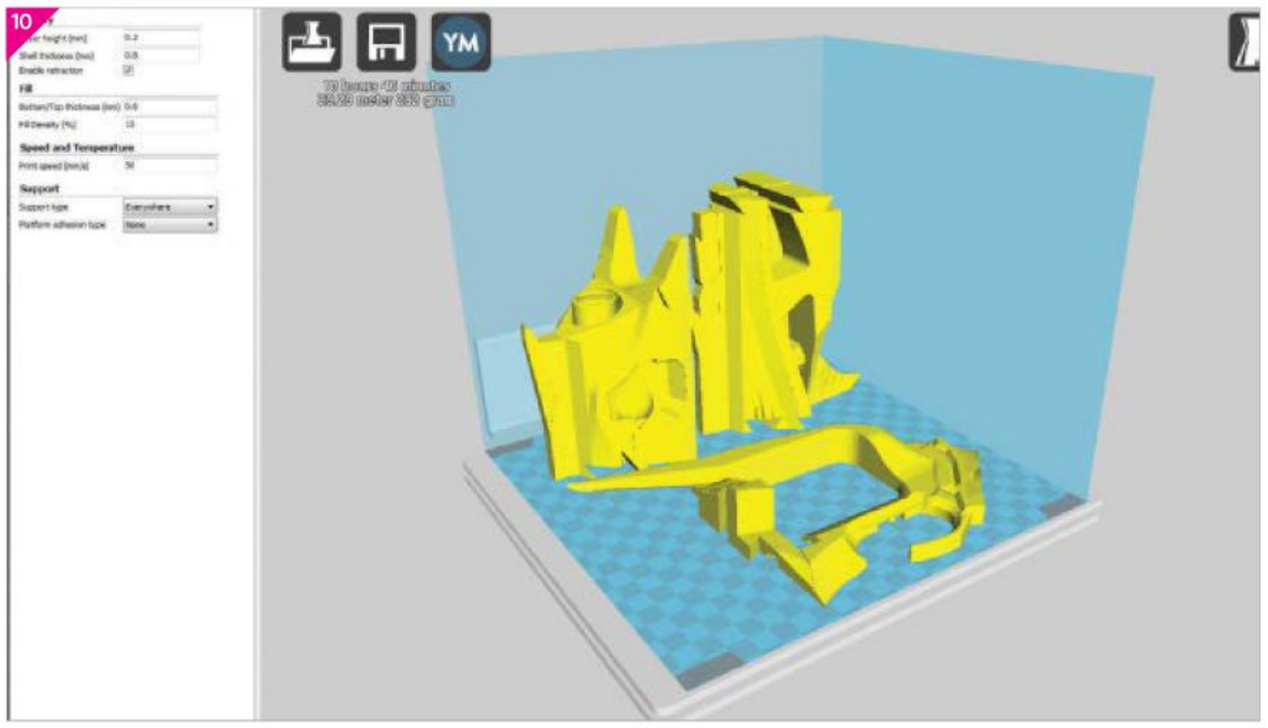
Kirby Downey

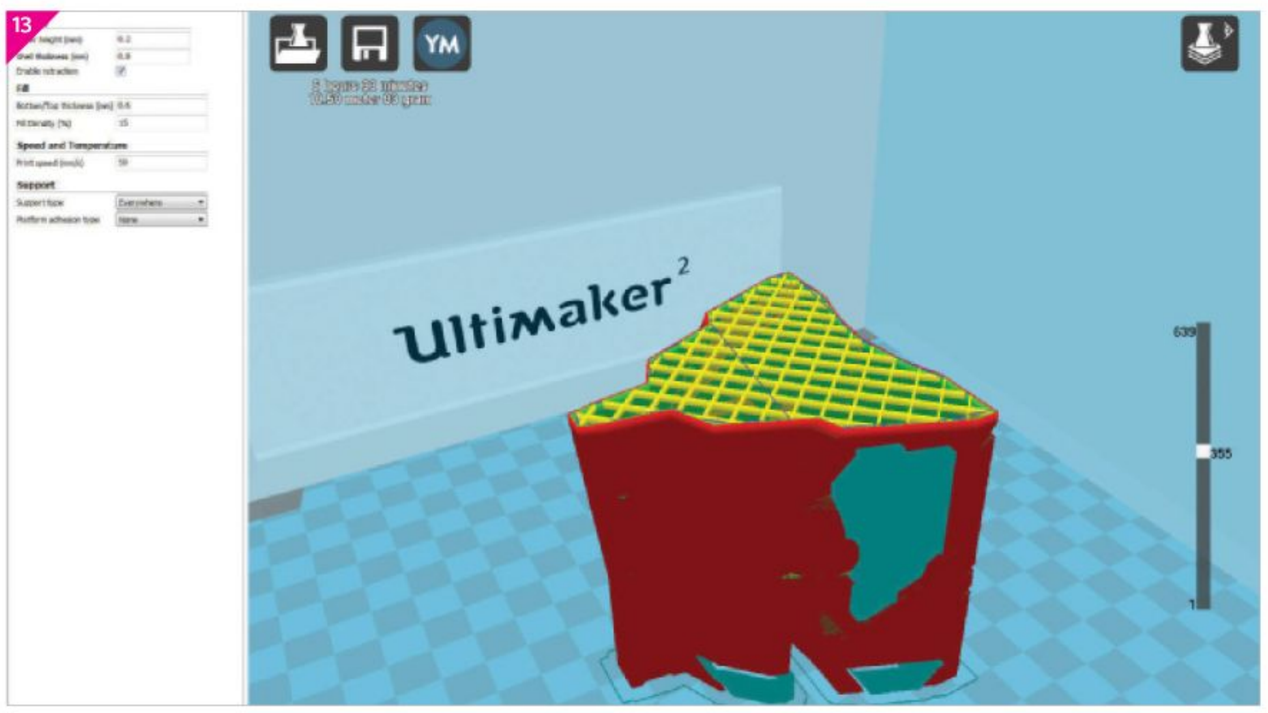
I am a qualified product designer from South Africa and currently based in London. I have been working with SOLIDWORKS for five years and with 3D printers for four years. I specialise in bringing objects from the screen to life and adding a functional aspect to it.

Thunderlord **SOLIDWORKS (2014)**
Thunderlord, which is 1.6m long, was made just before the game *Destiny* was released. It took around nine hours to complete the model and a week to print. This also features a variety of materials, it includes, PLA, carbon fibre, NinjaFlex and bronzeFill.

Vorpal blade **SOLIDWORKS (2014)**
The Vorpal Blade from *Alice: Madness Returns* shows the detail you can achieve with no support and low resolution

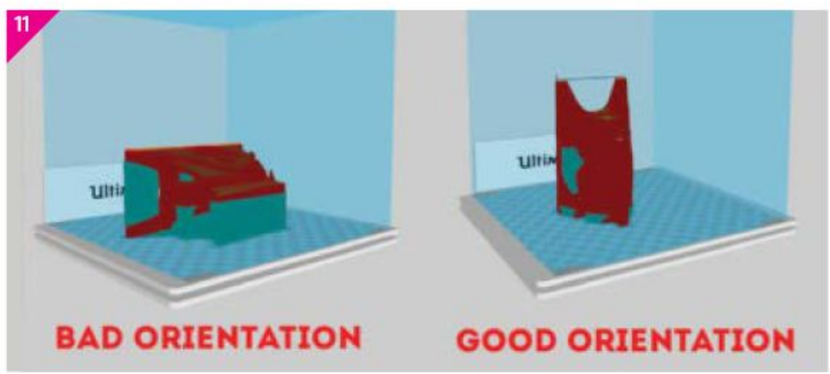
Frostmourne **SOLIDWORKS, ZBrush, Meshmixer (2014)**
This was a project done by myself and Elliot Viles. We set out to create an object with tight dimensioned fittings and organic sculpted parts. The sword skeleton and skulls were brought together using MeshMixer. This model was assembled with the same joints as Thorn and is also glue free.





10 Send to print Now that you have completed the fittings and are completely happy with your model you can then save the files as STL format in order to send them to print. Open your slicing software; we are using Cura but there are many that can be used. In here you can see your 3D models and how they fit on the bed. The software will also give you an idea of how the support material will behave.

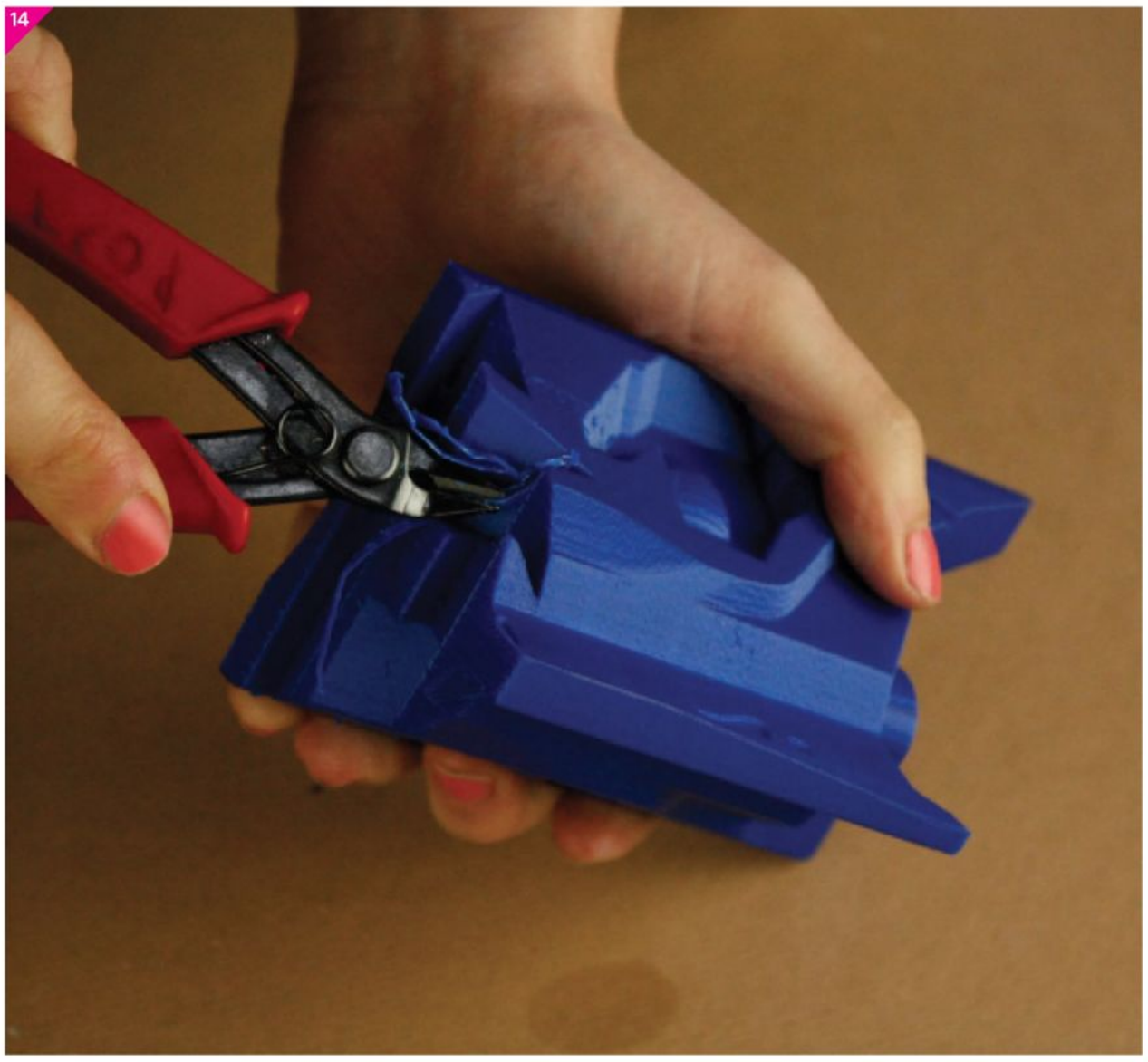
11 Print settings (orientation) Import the files into your slicing software to prepare for 3D printing. Orientation is key to getting clean models in a very short amount of time. The image below shows the model in red, the support in blue and two ways to orientate the object. The one on the left shows the ideal orientation, and a bad example of orientation on the right.



12 Print settings (layer height) Some settings are just as important as optimised details in the model as they can change the print time and detail quality. Printing at 0.2mm per layer is fine for models with long, flat surfaces (like the Thorn), but with highly detailed sculptural objects it's better to use 0.1mm layer height. Note that this will increase print time.

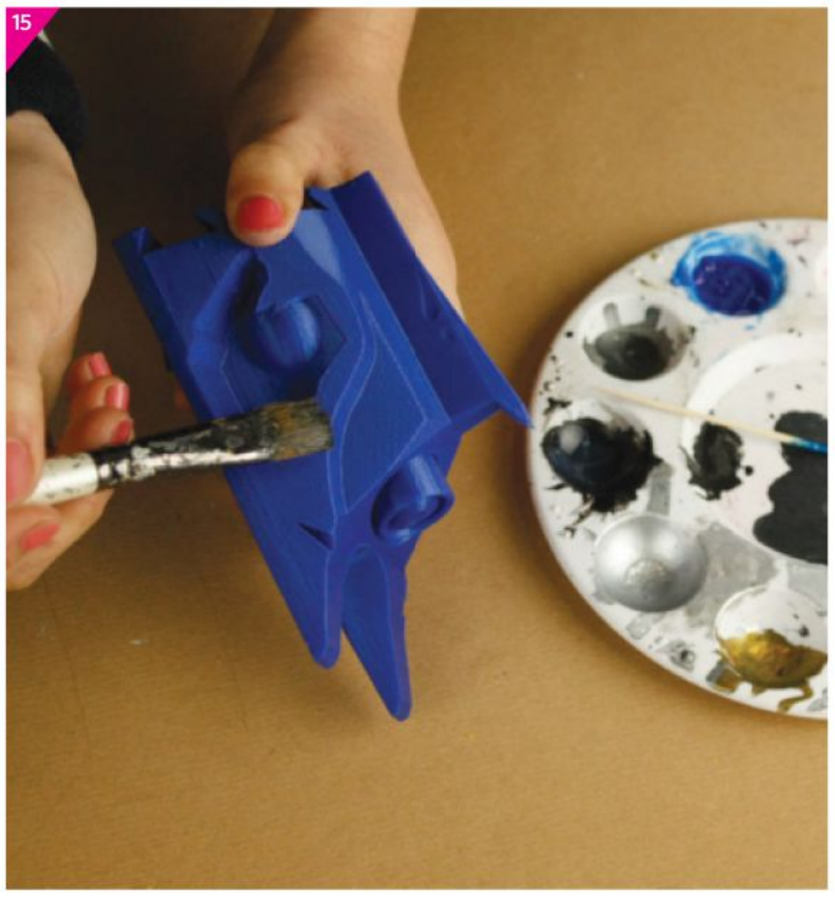
13 Print settings (infill) Infill is the honeycomb structure on the inside of the 3D printed model that allows it to be lightweight and strong. Infill can be used to add weight and strength if needed. With this model, 10 per cent infill (ie 10 per cent of the interior will be material) is enough as it needs to be light enough to be carried but if bumped it will not break.

> With highly detailed sculptural objects it's better to use 0.1mm layer height



Don't throw out any of the old plastic

Use your failed parts and test peices to experiment with finishing and painting techniques. For example, ABS filament can be bathed in acetone to create a glossy surface, but this comes with practice. Also experiment with various other materials like flexible NinjaFlex, bronzeFill, woodFill and carbon fibre.



14 Remove support material The best way to remove the support material is with a putty knife and with a crafter's knife. You can also use small files to help get moving parts to work smoothly.

15 Assembly and painting To assemble this specific model the parts are just slotted up to the notch then knocked into place with a rubber mallet. It is also easy to paint on the printed parts. You can use any paints on the model. Thorn had a black acrylic undercoat added and was then dry brushed with a light silver acrylic. The green was then added and a coat of clear coat spray-painted to protect the paint layers.

16 The final product Once the final product is printed and you have done all the post-printing stuff – you have cleaned off the support material, you've assembled the model and hand-painted all the colours that you wanted it to be – you will have a final product like our Thorn. This will be something that you can physically touch, hold, play with and show off to all of your friends.

All tutorial files can be downloaded from: **filesilo.co.uk/3dartist**

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Our experts

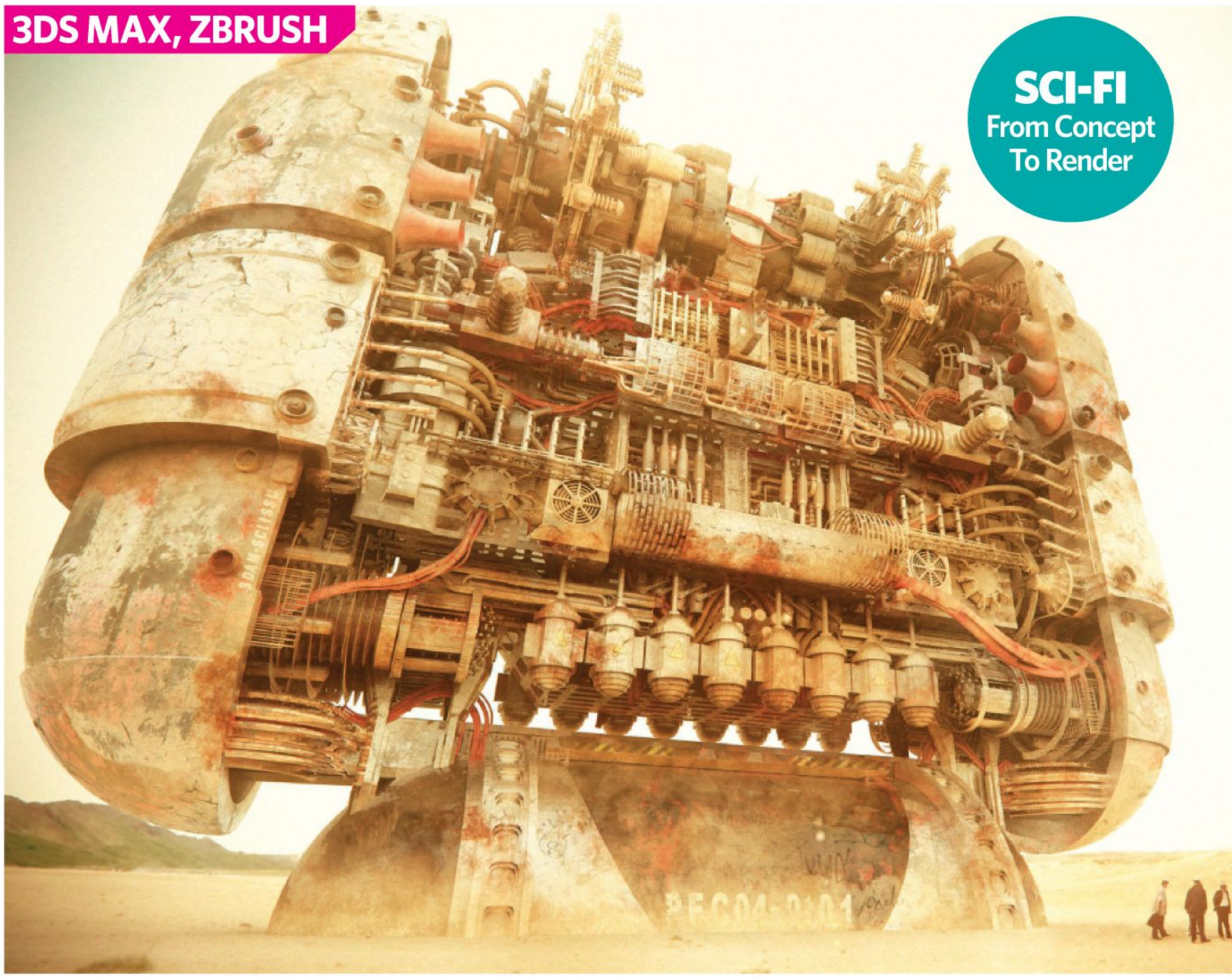
The best artists from around the world reveal specific CG techniques

3ds Max, ZBrush

Pablo Castaño
facebook.com/eletecedateando

Pablo is a concept artist, 3D/VFX designer and musician working in TV, videogames and film

3DS MAX, ZBRUSH



SCI-FI
From Concept To Render

Create sci-fi details in 3ds Max and ZBrush

In this tutorial we are going to tackle the task of creating a huge amount of details in our models in a really easy and fast way. At first glance, the idea of designing a complex and detailed model (a mech for example) can be pretty scary. By building small pieces to make one larger piece every step of the process turns into a design challenge rather than a technical one. Take, for example, the interior of a desktop computer which has an incredible amount of details. If you look closely, you'll notice that every piece is composed of a large number of basic shapes: cubes, cylinders, cones, planes and so on. This is by design, we as humans cannot create complex structures from thin air, we need to start from the basics, from the small and simple to the large and complex. Nature uses the same principle but through fractal repetition of growing patterns. This process of modelling an intricate 3D model using simple pieces can be really fun and relaxing when you are using kitbashing techniques in ZBrush.

First we are going to focus on creating a toolkit of low-poly pieces in 3ds Max, then we are going to prepare our objects for exporting as an OBJ format. Once we have it all imported in ZBrush we are going to split every piece into individual SubTools in order to create an Insert Multi Mesh brush (IMM). This can be a one-time process or an incremental one, once you have your IMM you can use it in a future sculpt. The piece that you planned to use as a surface detail in an electrical circuit can be used tomorrow as part of a futuristic skyscraper concept.

If you really want to develop a unique form and come out with a style of your own, take maybe 15 or 20 minutes a day, open your software of choice and model a few pieces. Try different styles, look for references online and play with the forms. Try to kitbash by yourself, take one object and merge it with another, change the length, the width and the scale. Your imagination is the limit. It's really not important which software you use to create the kitbash pieces, this tutorial uses 3ds Max but you can use the one you like the most – just keep in mind the poly count, you don't want to crash ZBrush in a couple of strokes!

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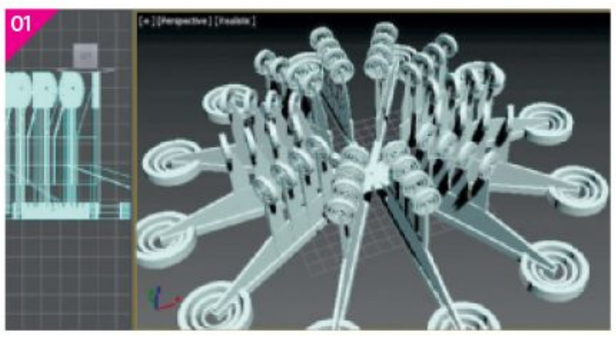
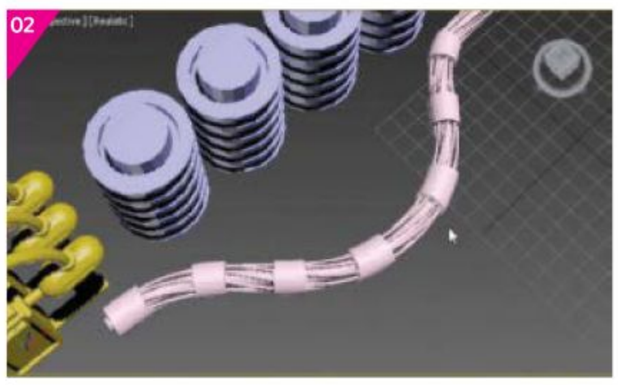
- Video tutorial

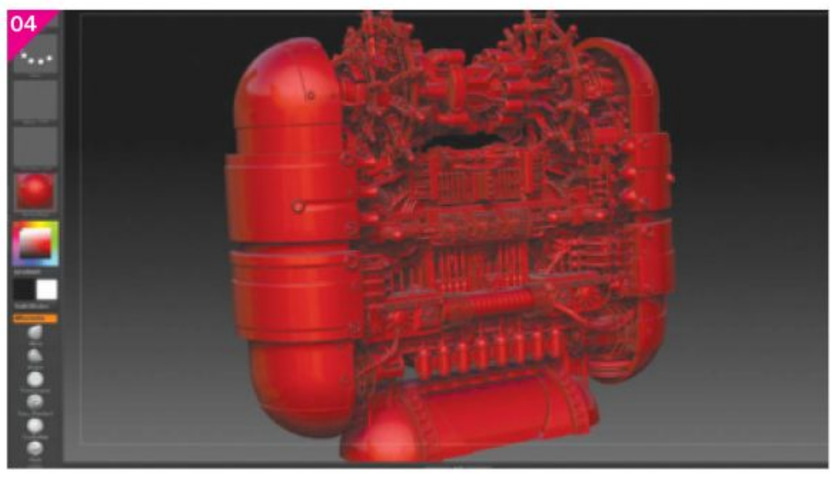
01 Build the objects in 3ds Max First create a few basic forms inside 3ds Max. Create a box on the grid and subdivide the height, length and width twice. Then go to Modifiers>Edit Poly, pick a few polygons, and use bevel and extrude to mess with the profile of the box. If you need to create a nice circular component for your concept try the circular array function in 3ds Max. Let's say that we had created an object made from a couple of boxes, a cylinder and a torus. Select all of the pieces, go to the top menu then go to Group->Group...>Hierarchy>Affect Pivot Only and move the pivot far away from the grouped object (this will be the centre of the circular array) and click on the rotation tool (if you skip this step the pivot is not going to be fixed for rotation translations). Now, in the top menu go to Tools>Array in the Rotation option. Click on the right arrow and this will enable the absolute values for the array angle. If you have the top view selected, enter 360 in the Angle text box for the z axis and press Preview. Now you can increment or decrement the number of copies of your array in the Count text box. Other cool details for a hard surface model are cables and pipes. Create a cylinder in the viewport, it has to be long and thin. Then go to Modifiers>Edit Poly-polygon select a few polygons and extrude it inwards. Again, mess with the shapes by using bevel, inset or extrude – just have fun. Once you are happy with the cable it's time to bend it. Create a spline (Create>Shapes>Line), click and drag to draw a curve, and guide the deformation of the cable. Select the cylinder, go to Modify>Quadify Mesh, choose Modify>Path Deform(WSM)>Pick Path then select the spline. If the result is not what you expected click 'Move to Path'.



02 Export the pieces from 3ds Max Once you think you have enough pieces ready, order every one of them side by side as this is an important step for creating the IMM: every piece has to face the same direction. Select each piece (and all of its constitutive objects) and collapse it (Utilities>Collapse) so we can be sure that every piece is a unique object. It's time to export! So go to File>Export and select OBJ:Exporter in the menu.

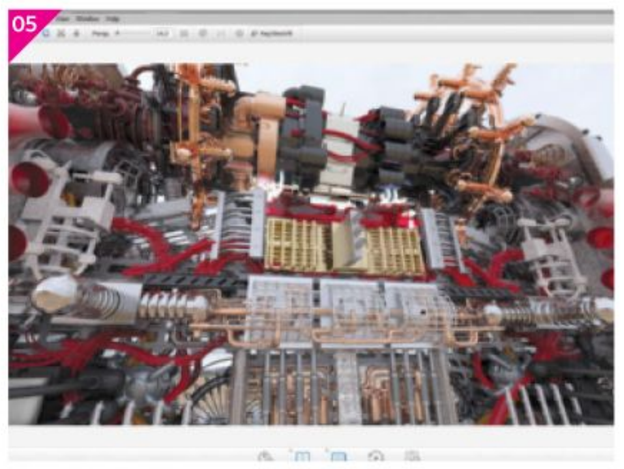


03 Create the IMM in ZBrush In ZBrush create an object in the canvas (a cylinder, a cube, or any other shape – it doesn't matter), enter Edit mode, click on Import in the Tool menu and select the OBJ file that you exported earlier from 3ds Max. All of the objects from 3ds Max should now be on screen, if you can't see them all just simply press F to frame all of the geometry in the viewer. But there is a problem! We only have one SubTool! Don't worry, if you press Shift+F you will see that every object is a different Polygroup. Use Opt/Alt+click or a pen tablet to align the objects flat on the canvas, the bottom must point away from you and the head towards you. This is important because the IMM will instance the geometry according to the orientation given by the SubTools in the moment of the creation of the brush. Go to SubTools>Split>Group Split and this will separate every object into a different SubTool. In the top menu click on Brush>Create InsertMultiMesh. If you look in the brush palette (press B to get to it) you will find your IMM brush at the bottom. Click on 'Save as' and save it in your BrushPresets folder (C:\Program Files (x86)\Pixologic\ZBrush 4R7\ZStartup\BrushPresets). Your IMM brush is now part of your brush palette.

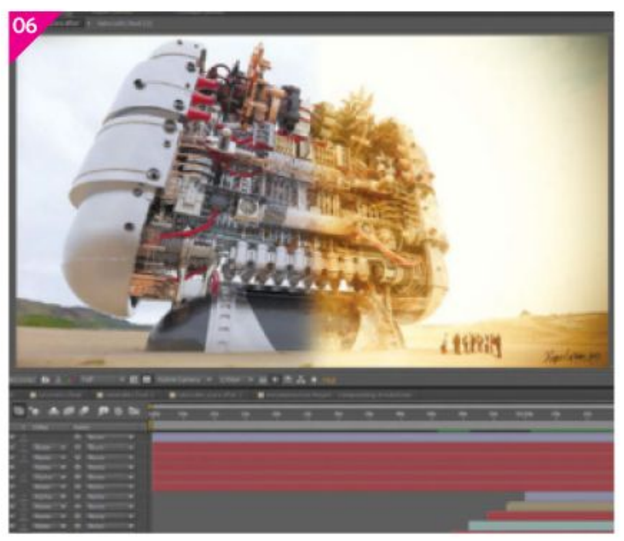


04 Build a base structure and kitbash it Let's face it, we can't start from the details, we have to have a structure to support our little objects in the first place. If you plan to add details to a model that you already have then skip this step, but if you are starting from scratch you will need a larger object to place the tiny pieces. Just put a box in your scene, DynaMesh it and cut away a few chunks with the ClipCurve brush, or use ZModeler to come out with a SubTool that enables detailing work. Once you feel happy with your base structure load your kitbash brush and press M on the keyboard, select a piece and brush it on the surface of the object that you have just created. Remember that you can use the symmetry option of ZBrush. Every time you do a stroke, a new detail will be created. If you want to separate every piece in a new SubTool press 'Split Masked Points' under the SubTool>Split panel after each new piece. This is the basic procedure for creating a custom IMM and using it in ZBrush, the rest is texturing, render and postproduction.

05 Materials and render On this occasion we will be using KeyShot for the render. In ZBrush go to the Render tab and enable the external renderer (ZBrush 4R7 and KeyShot Bridge). In KeyShot assign the materials to each SubTool by dragging and dropping the material from the library. Choose an environment and render the image, Remember to enable the Z-Depth pass inside the Render dialog in Keyshot.



06 Postproduction For the composing and tweaking of the render passes we are going to use Adobe After Effects. First, make a new comp and drop the base render and the Z-Depth pass in the timeline. Hide the Z-Depth pass and in a new adjustment layer add your favourite depth-of-field plugin (Camera Lens Blur or Frischluft's Lenscare to name a couple), select the Z pass inside the plugin and play with the parameters until you achieve the look that you are looking for. With Curves, adjust the RGB contrast as needed. You can also throw a grungy texture or fog footage below the adjustment layer and try a few blending modes to give a more weary look to the final composition.



Workstation Specialists WS-M170

A mobile workstation that uses a desktop CPU for the fastest possible rendering times

Due to space and power constraints, squeezing a workstation into a laptop-sized chassis always means a performance compromise, with low-powered, cut-down processors and graphics cards.

The 'U' and 'Q' mobile Intel processors run at lower clock speeds than the desktop variants for improved battery life, but this also means significantly slower rendering times. But by performing a few tricks, it's now possible to squeeze a full desktop processor and motherboard chipset inside a laptop: a route Workstation Specialists has chosen for the unique design of the WS-M170 17-inch mobile workstation.

It has a Core i7-4790K processor, a quad-core chip, which can be set to run at the same 4.4GHz clock speed as it does in a desktop workstation – particularly useful for 3D design work.

It also has 32GB of DDR3 memory and an Nvidia Quadro K3100M graphics card. The K3100M is one of the more powerful mobile Quadros, with 4GB of dedicated video memory, 768 cores and plenty of 3D muscle. The screen is a bright TN panel with a 1,920 x 1,080 native resolution. For connection to external displays, there's a pair of DisplayPort connectors and a single HDMI port, all of which can output 4K at 60Hz.

Rounding off this specification is a 256GB Samsung SM951 PCI Express M.2 SSD, which is the fastest storage device you can get for a laptop. We measured blistering speeds of 1600MB/sec sequential read and 1260MB/sec write, with a 1TB hard disk for extra storage.

With a desktop processor, we'd expect CPU rendering performance comparable to a desktop workstation, and that's exactly what we've got from the WS-M170. A CINEBENCH R15 result of 838 matches or even beats workstations with a Xeon E3 chip, and rendering times in 3ds Max were slightly better as it completed the 1080p test a few seconds faster. These are very impressive results that automatically propels the WS-M170 to the top of the mobile workstation performance chart.

As an all-round mobile GPU, performance from the K3100M is also solid, with SPECviewperf results comparable with entry-level desktop cards.

Mobile workstations are usually large and very heavy, and the WS-M170 is no exception, although Workstation Specialists sells a more portable 15-inch version – the WS-M150, which has the same specification aside from lacking a subwoofer.

You can also customise the various components, to add a beefier K5100M graphics card, or cut the cost with a less powerful K1100M GPU.

With any mobile workstation, battery life is less of a concern than its raw performance, and that is especially true when there is a desktop CPU involved. If you choose to run a long rendering job, the system must be connected to a power socket, as the battery life is certain to run out quickly when it is under full load.

There are a few settings that can adjust the load on the battery. In 'High Performance' mode, with the WS-M170 connected to a power socket, it runs at the full 4.4GHz Turbo frequency of the Core i7-4790K, perfect for rendering. Unplug the power, and it drops to 2.2GHz. Change to 'Power Saving' mode and the CPU drops to just 800MHz when idle, which is fine if you are just using the WS-M170 for browsing the web or for email.

With the screen brightness set to 40 per cent, we squeezed 1 hour 26 minutes from the PCMark 8 battery test in 'Power Saving' mode. This is hardly enough to even watch a film, but given how the desktop technology inside it is so thirsty for power, the MS-170 could have fared even worse, so this is not an entirely bad result.

All in all this is one seriously impressive laptop. The screen is good, the performance is outstanding and the price is comparable to other high-end mobile workstations – although with its desktop CPU, the WS-M170 is guaranteed to outperform every single one of them.

Orestis Bastounis

FAR RIGHT The Samsung SM951 M.2 SSD managed an impressive 1.6GB/sec transfer rate

FAR RIGHT BOTTOM There are four USB 3.0 ports in addition to two DisplayPorts and a HDMI port with 4K output

RIGHT The Core i7-4790K has consistently proved itself to be a formidable CPU for rendering work

> With a desktop processor, we'd expect CPU rendering performance comparable to a desktop workstation, and that's exactly what we've got from the WS-M170

ABOVE The chunky chassis is a surprisingly elegant design It gets quite hot in use, although the fan noise is never uncomfortably loud

Essential info

Price	£1,699
Website	workstationspecialist.com
OS	Windows 7
CPU	Intel Core i7-4790K
SSD	Samsung SM951 256GB M.2
GPU	Nvidia Quadro K3100M
RAM	32GB DDR3 memory
Display	1920 x 1080

Summary

★★★★☆ **Features**
★★★★★ **Performance**
★★★☆☆ **Design**
★★★☆☆ **Value for money**

Verdict ★★★★☆

For high-end 3D design use in CPU-bound applications, the WS-M170 puts many other mobile workstations on the market to shame

ABOVE Image created with Maxwell inside RealFlow, based on a simulation with Hybrido of flood on a complex landscape

BELOW Hybrido is increasingly solid and fast, even with the interaction of complex surfaces as you can see from our test

RealFlow 2015

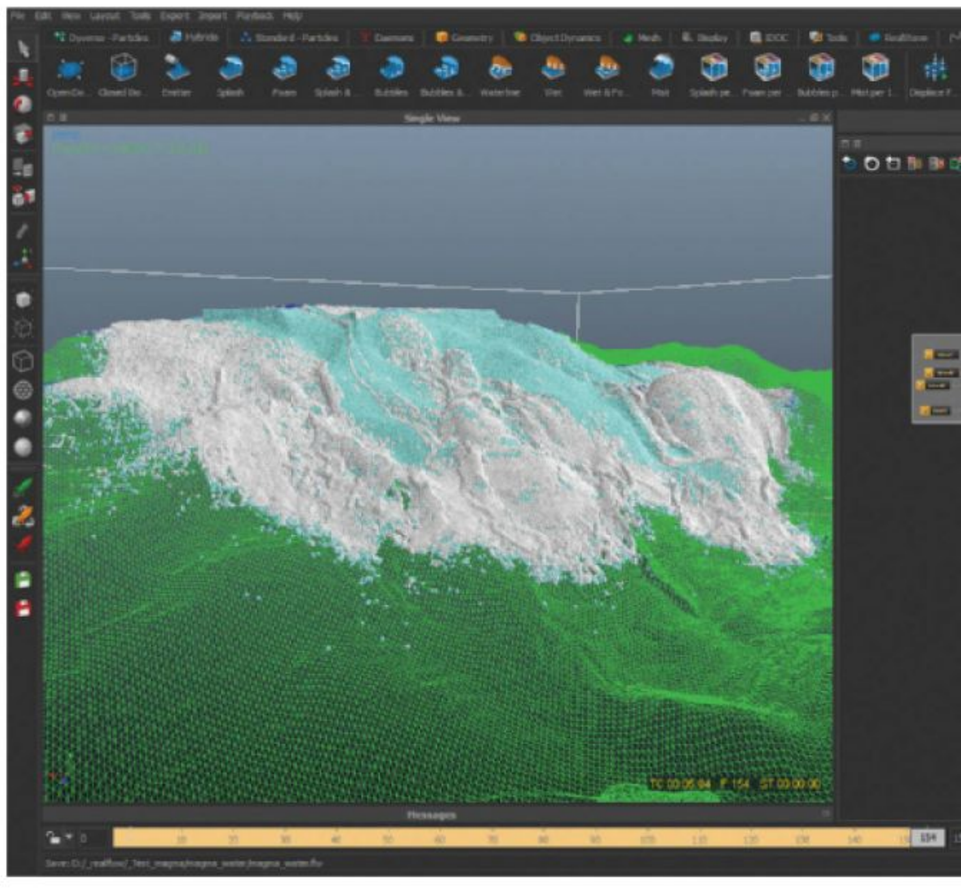
This new release marks a change for the fluid simulator and confirms its leadership in this field

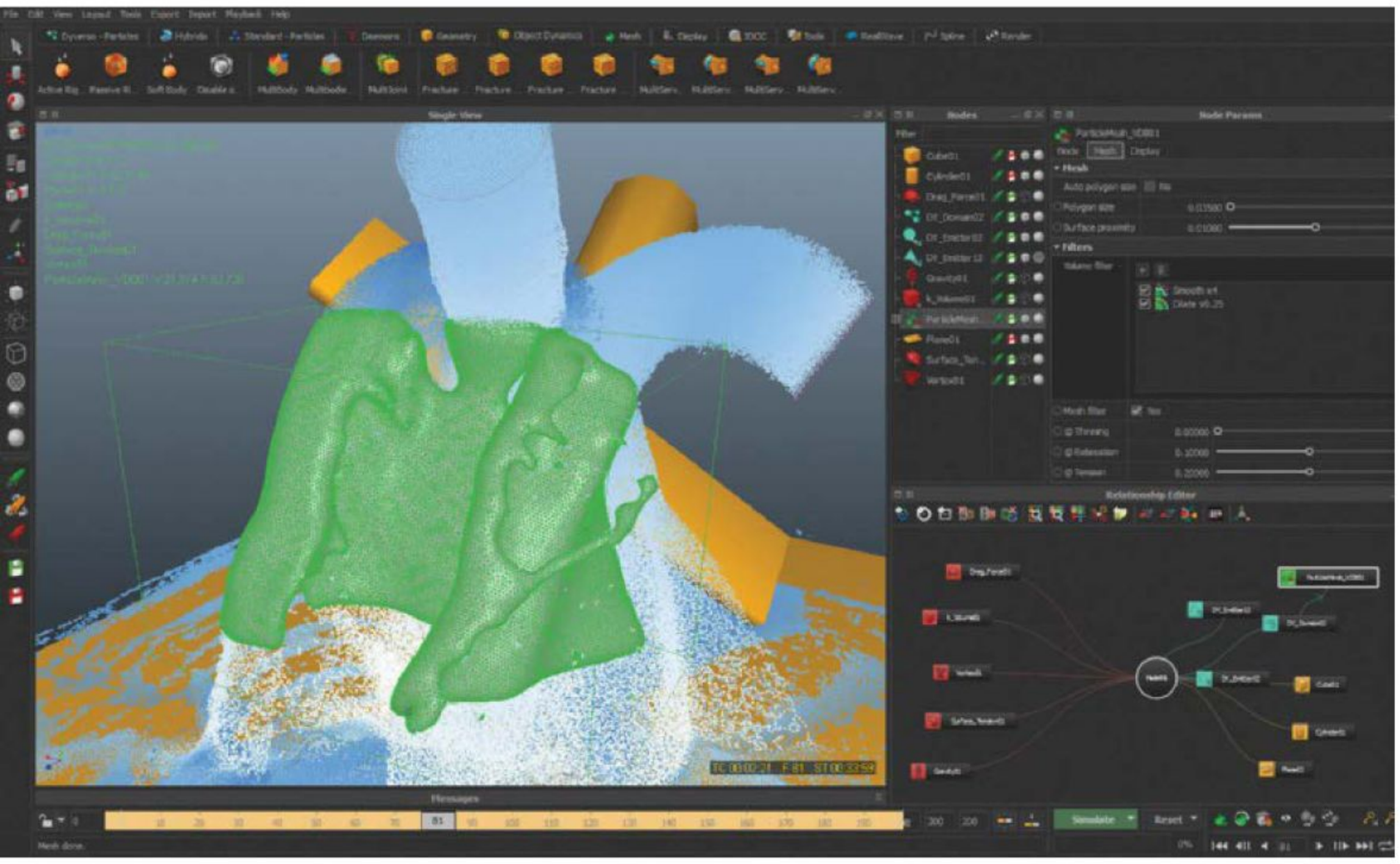
Next Limit has just released the new version of RealFlow with many new and interesting features. Not only is there improvement with existing tools but also new ones. Next Limit is also revisiting online documentation with RealFlow 2015, paying particular attention to educational material with RealFlow 101 (**support.nextlimit.com/display/rf2015docs/RealFlow+101+Guides**).

Inside the software, the interface has been updated with a new layout and integration of sliders, with better access to features such as cache management, more control for choosing how to visualise your items in the viewport, key animation creation, access to expression and the ability to restyle the relationship editor. The Spreadsheet panel has totally changed, with the possibility to customise its parts for a better workflow.

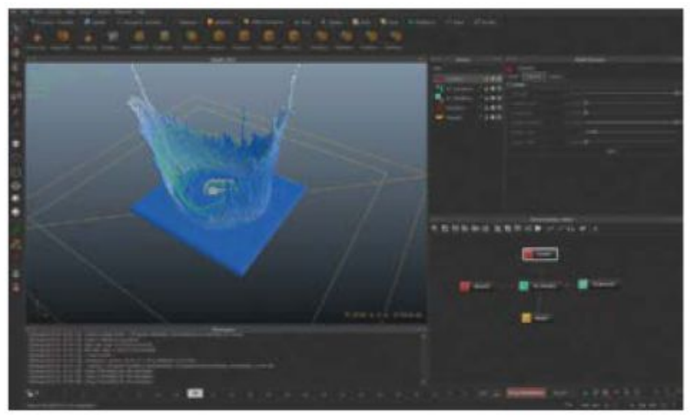
In the daemon you can find the option 'fall-off' operated via a graphic and visual effect in the viewport. On the daemon shelf you can also find an interesting new tool called Crown Daemon that allows you to create 'splash' shapes with the ability to guide them in a direction determined by the user.

Dyverso Fluids is a new solver for simulations of small and medium scales, and this is based on two different methods: SPH and PDB. The SPH (Smooth Particle Hydrodynamics) is considerably faster than the Standard Particles, three times faster in fact. The PBD (Position Based Dynamics) solver is totally new and much faster compared the SPH. They are both very fast because they use the power of the GPU. Next Limit confirmed some limits with these solvers and it will work on fixing them with upcoming patches.





> Dyverso Fluids is a new solver for simulations of small and medium scales

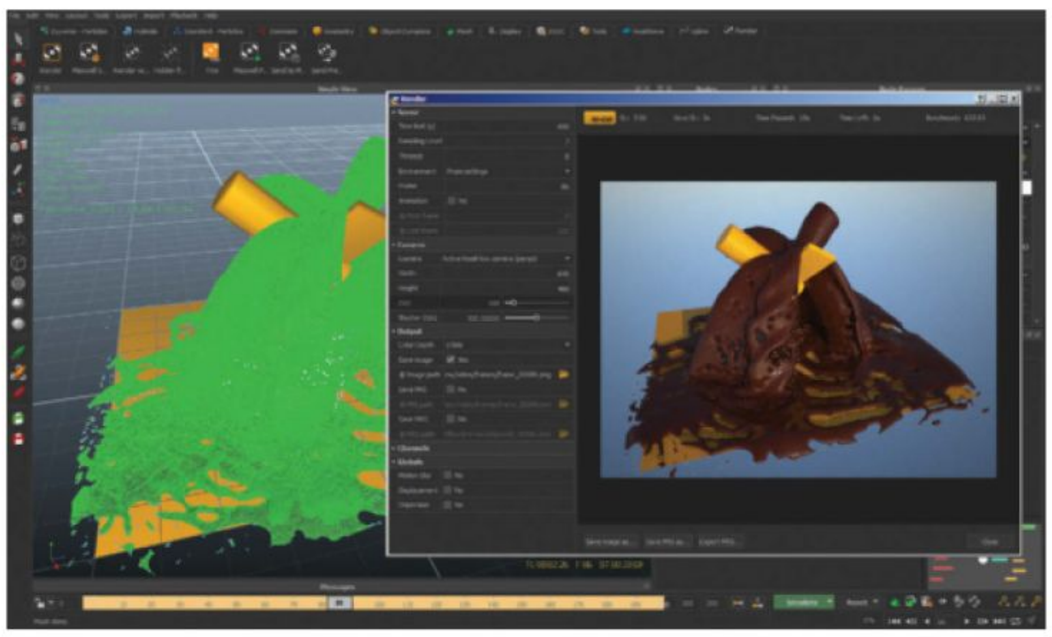


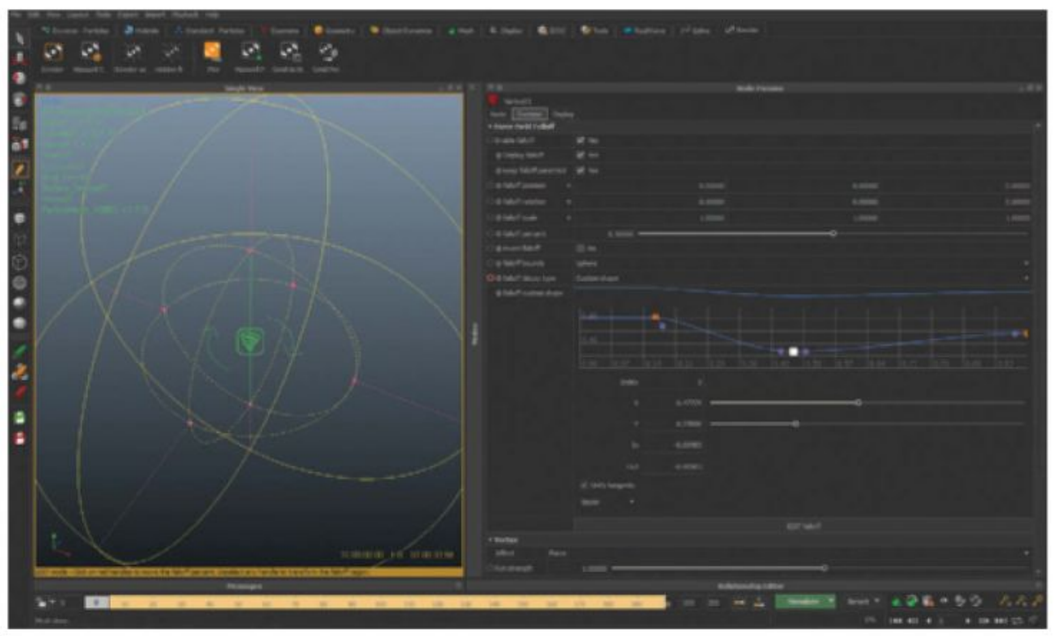
ABOVE This shows the Crown Daemon applied to the Dyverso Solver; you can drive a custom direction with your particles

LEFT OpenVDB (Mesh) is very fast and convenient with the options Bounded and filters like Smooth, Dilate and Erode

BELOW LEFT An example of rendering inside RealFlow with Maxwell Render; it's a very clean and fast system with good integration as well

BELOW Fall-off effects inside the daemon is a fully customisable curve for creating different kinds of action for your simulation





OpenVDB in Mesh is perhaps one of the most spectacular and interesting features in RealFlow 2015, introduced for realising very light meshes and much faster, whilst respecting the old mesh system contained inside the software. You can activate different filters (Smooth, Dilate and Erode) that enable you to realise more realistic surface.

Bounded is another very interesting option that enables you to create only a specific area and not the entire mesh, this way you can save time on simulating only a few areas before realising the final version of your mesh. The integration of this algorithm (from OpenVDB) isn't only focused on the creation of the mesh, it also helps the user in developing even better management of hardware resources and interaction of objects in the form of Hybrido. This is a more solid, robust tool, which is very much appreciated by RealFlow users, particularly when it is used for large-scale simulation. This module in RealFlow 2015 is an improvement on speed, especially when working on processes of collision between Hybrido and other very complex animated objects.

You can also now import your scene directly into RealFlow and render it with Maxwell Render without exporting your simulation from other 3D packages first, so this is very useful and helps you to reduce workflow time.

Other new tools introduced are Spline and the Text (with the new shelf), where you can enter text directly in the viewport – it can be as elaborate as an emitter or drawn as a rigid or soft body. The splines, in addition to the possibility of importing files in SVG format, can adapt the spline emitter making it a faster process than the old version.

Next Limit also changed the price of licences making it much more accessible than previous versions. At €1,995, RealFlow 2015 comes with a single licence including one year of maintenance and one year of Maxwell Render licences.

RealFlow has proved an excellent application for simulation of fluids and Next Limit confirms its position as leader of the industry not only for its products, but also in its ability in releasing more cutting-edge software designed for the end user.

Matteo Migliorini

Essential info

Price	€1,199 / $2,245
Website	realflow.com
OS	Windows 7 SP1, Windows 8, or Windows 8.1 64-bit / Linux 64-bit (with a 2.6 Kernel and glibc 2.11.3 / OS X 10.8 and up 64-bit
CPU	Core 2 Duo processor and up
RAM	Minimum 4GB
HDD space	1GB for installation

Summary

★★★★☆ **Features**
★★★☆☆ **Performance**
★★★★☆ **Design**
★★★★★ **Value for money**

Verdict ★★★★☆

RealFlow 2015 is a very good piece of software with many positive aspects and a new workflow that empowers rendering

Technique focus

Incredible 3D artists take us behind their artwork

SCULPTING CLOTHING One of the greatest things in Michelangelo's works is how he sculpts the cloth. I tried to sculpt as close as I could get to his sculptures. The brushes I used were ClayBuildup, Dam_Standard, Move and Standard brushes for the basic forms and later Pinch brush for sharpness (which I then modified further with Pinch and Standard brushes).

Reza Sedghi
lowrez.artstation.com

3DArtistOnline username
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Software
ZBrush, 3ds Max, V-Ray

Pieta Reconstruction, 2015

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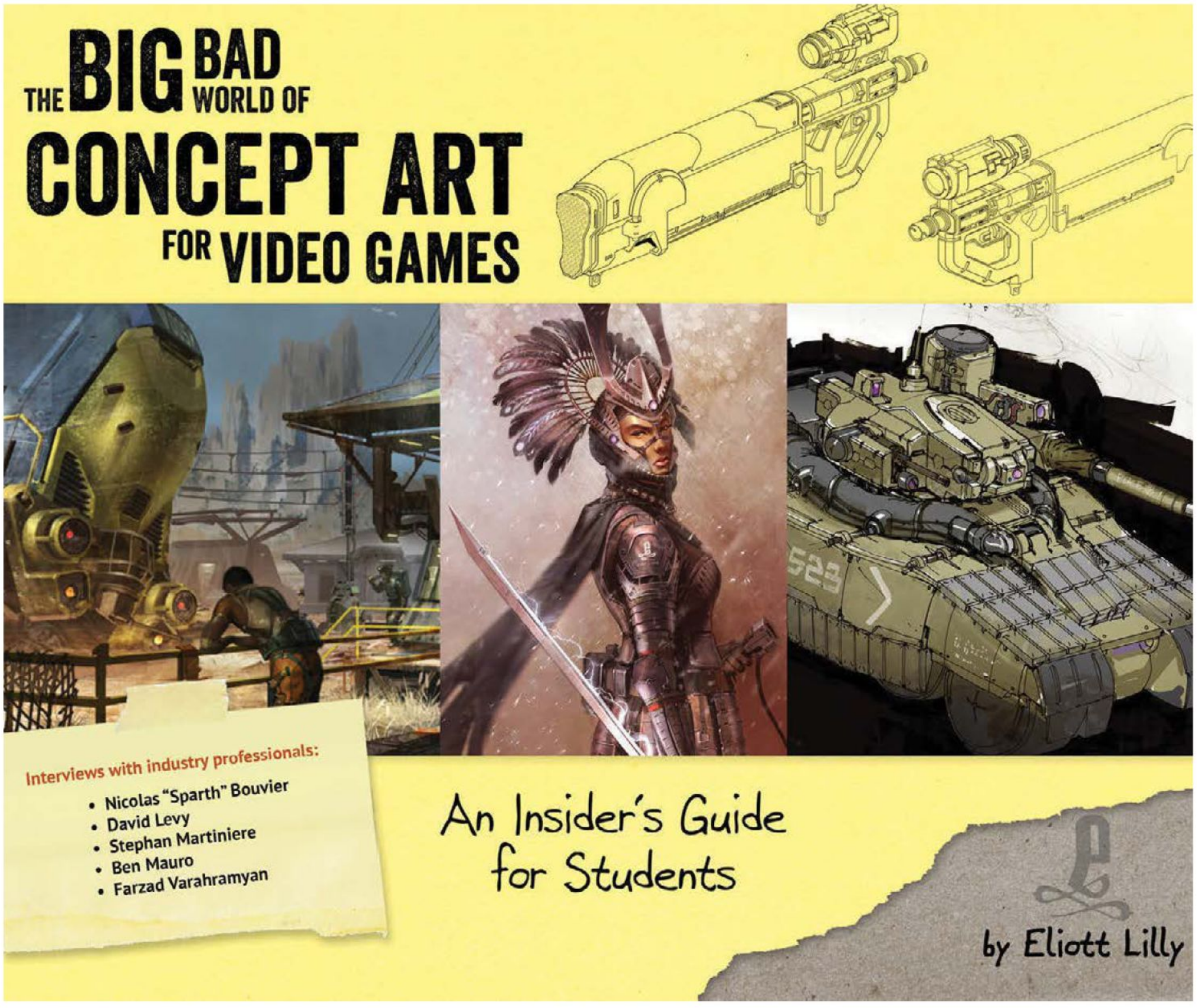

The Big Bad World of Concept Art for Video Games

Eliott Lilly has drawn on a long and successful videogames career to pen a guide that is useful and precise

It's easy to assume that writing a guide for art students would be an easy enough task – after all, if you have the requisite experience in the industry it should be a case of just churning out what you learned back in the day, right? Maybe with a few tales of the time you had to crunch until 2am or the time your computer crashed and you lost a day's work. What most budding authors fail to understand, though, is that writing in a voice that is clear, critical and enthusiastic goes a hell of a long way and makes the learning experience that much more fruitful. This is exactly what Eliott Lilly has achieved with his book.

From the very start he doesn't pull any punches when describing the nature of the videogames industry and the long, and often arduous, path that you'll be embarking on if you want to be a concept artist. The common stories of crunch time and missteps are present and correct in Lilly's book, but they're recalled in a way that paints them as just part of the job and not something to be scared of. At the end of the first chapter, Lilly poses the idea that if you've read the first 30 pages or so and are a little put off, then maybe a career in videogame concept art isn't for you, but has the sensitivity and foresight to outline in brief detail the other paths that are open to you in the videogame industry, such as working more in the 3D space as a modeller or texture artist.

What we really loved was Lilly's insistence on explaining in no uncertain terms just how important a superhuman work ethic is and how crucial it is that you take control of your own education wherever possible, whether it's through swapping out classes that won't develop you for your chosen career or plain old hard work – one of the big lessons here is that if your classmates are spending between two and ten hours on a university assignment, you should be spending 20

hours plus on the same task. It might seem elementary, but for some people the bare minimum seems enough. Lilly is quick to debunk this myth throughout his book, providing authoritative advice that, dare we say it, probably outweighs that of a number of qualified teachers in the art world. He's also brought on a couple of concept experts like Ben Mauro and David Levy to talk about their respective careers and their advice for any up-and-comers.

This really is quite a comprehensive learning tool, but in an unorthodox way. It probably won't teach you anything you don't know in theoretical terms, but it can expose you to the experiences of an artist who has had a clear goal and has successfully achieved it, despite moving into an industry with an insane amount of competition. As you'd expect, there's an awful lot of Lilly's artwork throughout the book that neatly illustrates his progression from high school right through to his professional work. Each of the chapters is clearly defined and, in design terms, the whole thing feels like a big scrapbook – there are certain spreads that are just made up of artwork with little annotations, for example; the whole thing is well paced and easy to follow, which is exactly what you need from a book like this.

As it stands, if you're a student or enthusiast that has set their sights on videogames, and in particular concept art (2D or 3D), this will act as an excellent source of inspiration from both an artistic standpoint and a real, tangible one as well through its life lessons and career advice. Some of you will see a lot of it as common sense, but for many this book will act as both a succinct introduction to videogame concept art and an excellent education and career tool. Even if the videogames industry isn't for you, the general advice here would still make this book well worth a read.

Steve Holmes

> "What we really loved was Lilly's insistence on explaining in no uncertain terms just how important a superhuman work ethic is"

LEFT The first chapter goes over what the role of concept artist actually entails, as well as many of the pitfalls that you can expect from time to time during your career

BOTTOM LEFT Each chapter is clear in its intentions from the get-go and they're all really easy for you to follow

BELOW The fourth chapter goes into detail to help you put together a fantastic portfolio so that you can stand out to employers

Essential info

Price	$29.95
Author	Eliott Lilly
Publisher	Design Studio Press
Website	designstudiopress.com
ISBN number	978-162465020-8

Summary

★★★★☆ **Quality**
★★★★★ **Ease of use**
★★★★½ **Overall usefulness**
★★★★☆ **Value for money**

Verdict ★★★★½

Don't expect an art lesson – this book foregoes tuition for cold, hard truths about a career in concept art and does it brilliantly

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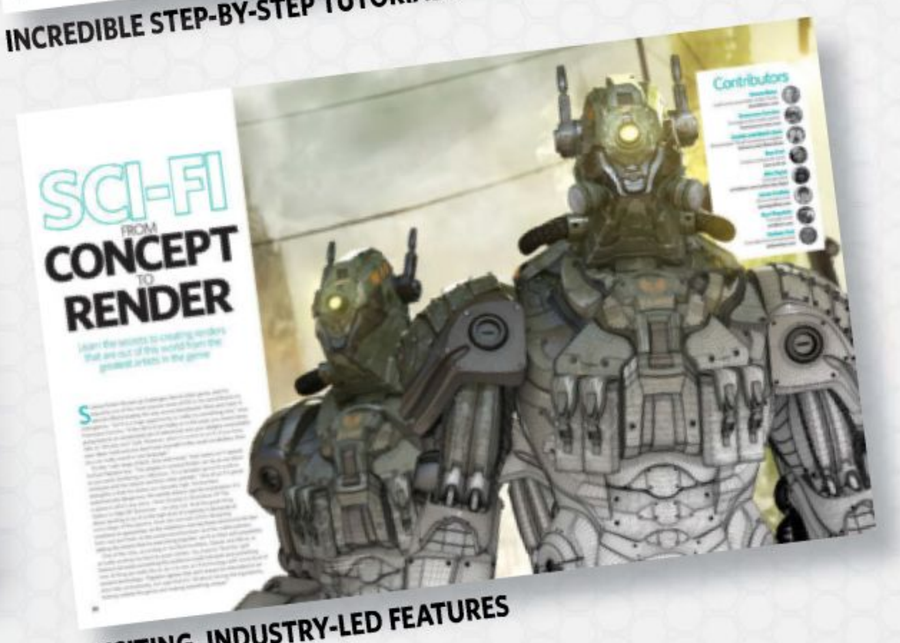

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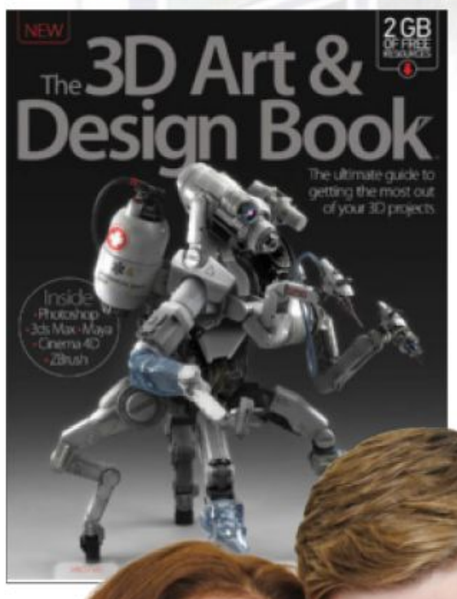

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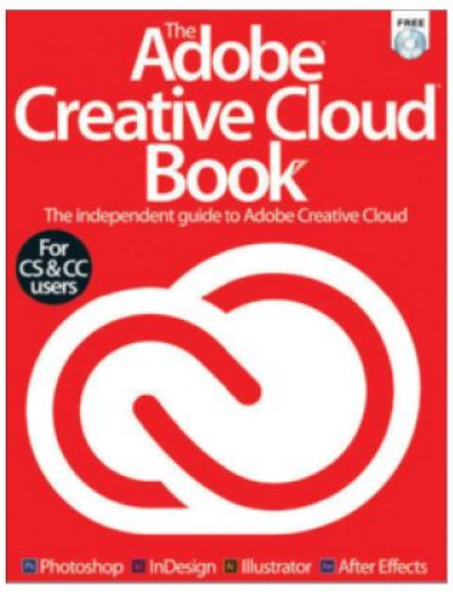
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The Hub

The inside guide to industry news, VFX studios, expert opinions and the 3D community

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088 Community news

Win £10,000 worth of software

3D Artist teams up with the BFX Festival and two great charities to bring you an awesome competition

090 Industry news

MARI 3 released

All the latest from SIGGRAPH 2015, plus footage from The Blender Foundation's 'Cosmos Laundromat'

092 Studio Access

Stargate Studios

The VFX outfit tells all about compositing zombie hordes and its reliance on tools like V-Ray

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Win £10,000 worth of software with BFX

In conjunction with the 2015 BFX Festival, 3D Artist is thrilled to run this special competition

To be in with a chance of winning our fab prizes, choose one of the short, highlighted scripted scenes detailed on the next page and produce a fully rendered and lit scene that creatively interprets the emotion and drama of the narrative.

The two scripts were chosen by two great charities, The Anthony Nolan Trust and Dyslexia Action, as part of this year's BFX Competition, which is being supported by Kingston Smith. Your visuals will need to be supported by a short written treatment of around 250 words that is both creative and technical – it should clearly explain your methodology and your software platforms of choice as well as describing your creative intentions behind the render.

This amazing competition has been split into two distinct categories: Students/Hobbyists and Professionals/Graduates, with some amazing first-place and second-place prizes for each category. **To enter this incredible competition, send your final hi-res image to 3dartist@imagine-publishing.co.uk via WeTransfer.com, along with a separate accompanying email detailing your name, image title and whether you are a Student/Hobbyist or Professional/Graduate. Make sure you use the naming convention: Image Name (Category).**

1st prize – Professional/Graduate
- 1 x Houdini Base
- 1 x Commercial V-Ray
- 1 x RealFlow
- 1 x The Foundry Production Collective (MODO, MARI, NUKE) – Commercial licence
- 1 x Maxwell Render

2nd prize – Professional/Graduate
- 1 x RealFlow
- 1 x Commercial V-Ray
- 1 x 6 months access to ftrack for up to 10 users

1st prize – Student/Hobbyist
- 1 x Academic V-Ray
- 1 x The Foundry Production Collective (MODO, MARI, NUKE) – Student licence
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2nd prize – Student/Hobbyist
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‘Pageturner — A love letter to Literacy’ chosen by Dyslexia Action

by Simon Schneider

INT. DYSTOPIAN RAMSHACKLE LIBRARY. DAY.

A young GIRL in tattered clothes enters a library, everything is in ruins.

She’s watched from the shadows.

She turns down one aisle and shuffles through it cautiously.

SNAP, books jump out at with jagged page-teeth. She dodges and manoeuvres away from them.

Backed into a corner, the books surround her, snapping like piranhas. The girl grabs a nearby stapler, shooting staples at the books that leap. Mid-flight they get flung back. Just before the girl is overwhelmed she notices two glowing eyes from the darkness, she’s awash with fear.

CLICK CLICK. The stapler is out and the figure in the darkness pounces.

Cowering, the girl closes her eyes.

INT. ORDINARY PUBLIC LIBRARY. DAY.

When she opens them, she’s met with a sympathetic librarian. The librarian lends her a hand to help her up.

Sitting at a table, the girl is helped by the librarian in reading a book.
SUPERIMPOSE: Dyslexia Action is devoted to changing the lives of people with dyslexia.

‘Saved by the Cell’ chosen by Anthony Nolan

by John Thornton

EXT. EMPTY WHITE SPACE. DAY.
Pop. TOM, a simple lad, appears.

VOICE OVER
This is TOM. Say hello TOM.

TOM has a little gulp and does an awkward, little wave.

VOICE OVER
(cont’d)
This is what Tom thinks stem cell donation is like.

Darkness. Big, muscly DR VAMPIRE crashes in — Tom screams. Dr V’s fangs are two huge syringes — Tom screams louder.
Dr Vampire ties him up whilst reading a book called 50 Shades — Tom screams loudest.

VOICE OVER
(cont’d)
Pretty scary, huh? But that’s not what it’s like. Silly Tom.

Lights up. Dr Vampire chuckles, ruffling Tom’s hair.

VOICE OVER
(cont’d)
It’s mostly just lying in bed.
Tom raises his hand excitedly, pointing at himself.

VOICE OVER
(cont’d)
Yes Tom, even you can do that.

Pop. Dr Vampire’s gone. In bed, Tom floats through rainbows with a TV.

VOICE OVER
By donating stem cells, Tom’s giving something very special. Better than an Xbox! Tom’s giving someone hope. Well done Tom.

A patient and doctor float next to Tom. He gives them a thumbs up. With small smiles, they thumbs up back.

Anthony Nolan logo, details appear on screen:

VOICE OVER
To find out how you can be a hero like Tom visit anthonynolan.org

Some extremely attractive NURSES swoon over Tom in his bed.

VOICE OVER
Pfft, no, the nurses won’t be like that.

Sorry Tom. Pop. The nurses disappear. Tom looks glum.

BFX line-up takes shape

The BFX experience is split into three parts, each aimed at different kinds of VFX enthusiasts

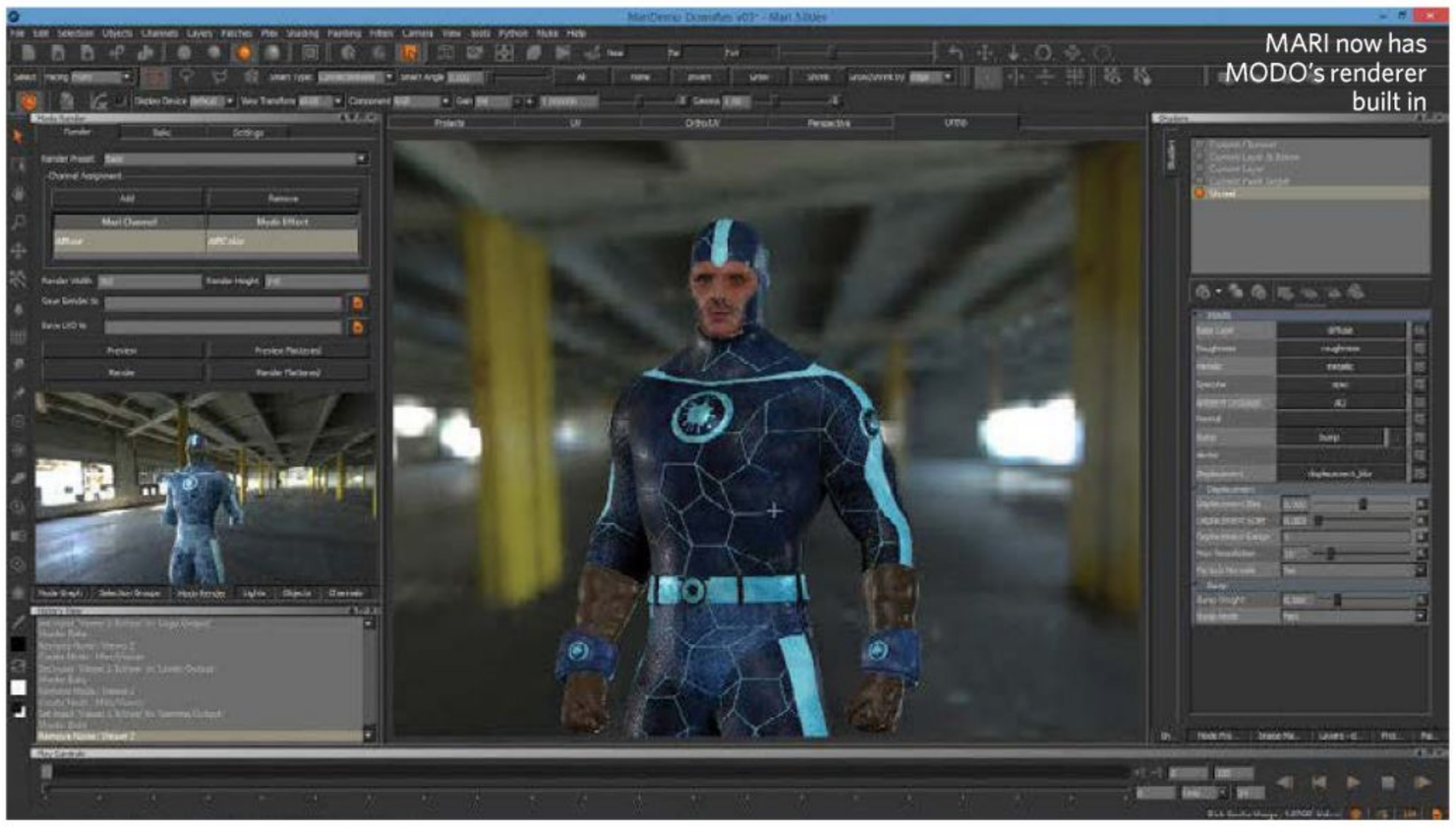
Now in its third year, BFX Festival returns to Bournemouth International Centre, UK. So far, confirmed speakers and partners for BFX Festival include Disney Animation Studios, Aardman, Scott Pritchard from ILM, Double Negative, Adam Davids from MPC, Framestore, Dan Bethall from Iloura, Frontier Development, The Mill, Chaos Group, The Foundry, The Third Floor, Stuart Sumida, Paul Campion, Michael Defeo, Taylor James, BBC, HP, Microsoft, Eric Shaw (scriptwriter), Animal Logic, Tim Patterson (ex-Nickelodeon UK vice president) – plus a number who will be confirming soon.

The festival itself starts with BFX Pro, a one-day conference of presentations, demos, and networking aimed at CTOs, pipeline engineers, asset managers, service providers, professionals and academics working within the creative industries. They will be discussing current and future research, services and platforms, and their role within the sector. Themes will include ‘Tools for Iteration and Collaboration: Pipeline Empowers Creativity’, ‘The Cloud – Invisible Technology and the Backbone of the Future’ and ‘A/R & V/R – The Reality of Virtual Content’. There will also be a clear focus on production.

BFX Core is a four-day programme filled with presentations from top international studios, designed with professionals, students and hobbyists in mind. The event then culminates in a careers and recruitment day.

The Family Weekend will be jam-packed with events aimed at anyone with a keen interest in film, animation and computer games. The two days include public screenings, presentations and workshops – best of all, it’s free. Eric Shaw, who has worked on *SpongeBob SquarePants*, will talk about writing for animation. Stuart Sumida, an anthropologist who’s worked with Disney, DreamWorks and Pixar and on the *How To Train Your Dragon* movies, will make an appearance.

For tickets and more information about BFX, which runs from Monday 28 September to Sunday 4 October 2015, visit **bfxfestival.com**.



The Foundry introduces MARI 3

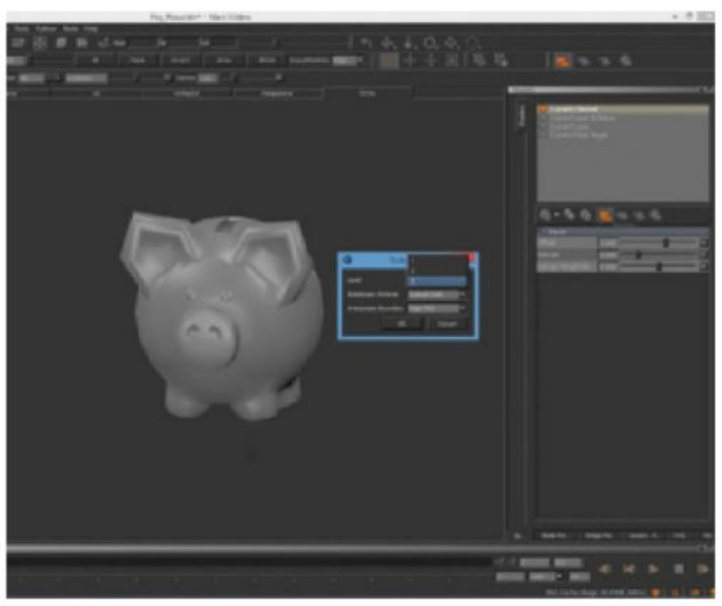
Software developer The Foundry showcases the latest release of 3D paint tool MARI at SIGGRAPH 2015

The fruits of 2012's merger between The Foundry and Luxology have ripened with the release of MARI 3. In a significant upgrade, the painting application has gained MODO's rendering capabilities which are accessible without requiring a MODO licence. This means artists can paint and check the final render quality at any time. Textures can also be baked using MODO's baking engine from within MARI, so there's less time wasted on switching apps and loading files. New Arnold, V-Ray, Redshift and Unreal Editor Shaders have been added too, enabling artists to see more realistic asset previews. The Unreal Shader was previously only available in the games-oriented MARI Indie version.

The newly exposed Node Graph, which is aimed more at advanced users, provides an alternate workflow to the Layer System. Frequently used functions can be grouped as custom gizmos and then exported for use in other projects. Four new APIs (Texture Data Access API, Geometry Data Access API, Display Driver API and Custom Graph Context API) have been developed to assist in integrating MARI into studio pipelines. Other updates include Open Subdiv Support, Colour Space Management and FBX Geometry support. MARI 3 is slated for commercial release in the third quarter of 2015.

Enhanced Texture Transfer

The Texture Transfer Tool that was added in MARI 2.6 has been designed to become more flexible in MARI 3. Height and Normal Maps can be generated between high and low-poly models. You can also seamlessly blur across patch boundaries and correctly transfer overlapping UVs.



Support in MARI for OpenSubdiv geometry lets artists work with subdivision surface meshes without needing to translate or pre-subdivide them

Real or Rendered?

Nvidia's DesignWorks to bring photorealism to professional designers

Akin to last year's GameWorks suite for videogame development, DesignWorks is a set of software tools, libraries and technology for designers to create accurately photorealistic buildings, vehicles and products. Included in the bundle are vMaterials, Material Definition Language (MDL), Iray SDK, and OptiX plus DesignWorks VR, which is a suite of tools for incorporating virtual reality into design software. As a library of calibrated physically based materials, vMaterials can be used in MDL (Material Design Language) based applications. MDL technology lets users create and share digital models of real-world materials between applications. This will be available soon as an SDK, providing a method for developers to access the expanding MDL ecosystem. Physically based rendering (PBR) engine Iray SDK features new algorithms reducing the time to visualise design changes. OptiX now includes support for the Nvidia Visual Computing Appliance providing scalable performance from laptops to data centres.

At SIGGRAPH, Nvidia challenged delegates to spot which drill is real and which is rendered

HAVE YOU HEARD? Lucasfilm and HP are celebrating Star Wars: The Force Awakens with a fan art contest

Google Zync launches beta

Google brings 1,600 dedicated Compute Engine cores online for cloud-based rendering

It's been a year since Google acquired visual effects rendering service Zync, which is now entering its first beta stage. The cloud-based rendering solution already used for films such as *Star Trek*, *Transformers: Dark Of The Moon* and *Looper*, runs on Google's Cloud Platform. Applications such as Maya, NUKE, V-Ray, Arnold, GenArts Sapphire and RenderMan are supported. When you're ready to upload your assets, there's a built-in cost calculator within the plugin which gives an estimate of the fee. Billing is done on a per-minute basis per machine for a minimum of ten minutes. Users will also have support during business hours with a four-hour response time.

Sign up for the beta and get $300 in Cloud Platform credits to try the service

A customisable panel inside Maya, NUKE and other tools offers at-a-glance access to information and utilities and lets team members communicate

Shotgun 6.3 sneak peek

The update promises to make it easier for teams to collaborate

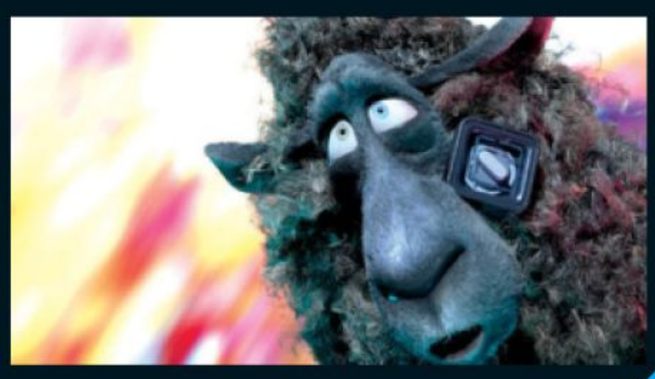
Due to release later this year, workflow updates to the Media App and Client Review Site include a global view to manage media from one location inside Shotgun. There are also new browsing options to help find playlists and the ability to launch media in RV. Improved collaboration lets clients upload attachments and reply to notes. The Workfiles App is upgraded to let users browse, load and save files quicker, with easier navigation for finding assets.

Blender Foundation unveils Cosmos Laundromat footage

The first ten minutes of Cosmos Laundromat – First Cycle, directed by Mathieu Auvray, is released

Production of the Blender Foundation's latest Open Movie Project 'Cosmos Laundromat' (code-named Project Gooseberry) has reached a significant milestone with the online release of Chapter 1 'First Cycle'. The ultimate aim for the project is to create the first ever free and open source animated feature film. It's based on a story written by Esther Wouda and stars a sheep named Franck who's stuck on a desolate island. The short, as well as weekly updates, can be found here **gooseberry.blender.org**.

Help get this short film made by joining Blender Cloud or becoming a sponsor. (CC) Blender Foundation



Autodesk gets in the game

Autodesk launches cross-platform game engine Stingray

Built on the Bitsquid engine, Stingray is an advanced new platform for making 3D games. Aimed at small to mid-sized studios, it lets developers alter the engine and renderer without having to access source code. Multiplatform deployment enables quick testing on a broad range of platforms including consoles, virtual reality and tablets. Architectural and design visualisation companies can harness Stingray for fly-through shots and animation.

Software shorts

Bringing you the lowdown on product updates and launches

3ds Max and Maya 2016 Extension 1

New 3ds Max features include Creation Graph updates, a new PBR DirectX Shader, Geodesic Voxel binding and Heat Map skinning. Maya gains Nodes in the Hypershade for look dev and support for Scalable Vector Graphic (SVG) files. Both also benefit from a live link to Autodesk's Stingray game engine.

V-Ray for NUKE

Chaos Group has released V-Ray for any version of NUKE (7 and up) on Windows and Linux. The renderer integrates production-quality ray-traced rendering, enabling compositors to use V-Ray's lighting, shading and rendering tools directly inside NUKE's node-based workflow. A demo version is also available for download at **chaosgroup.com**.

MAXON Cinema 4D R17

The new version brings a wealth of new and updated features such as a Take System for improved functionality above the Render Layer System, Lens Distortion Support, Animation Workflow Enhancements, New Spline Tools, a Graph View for Motion Tracker, and Houdini and SketchUp Integration. Full details can be found at **maxon.net**.

V-Ray for NUKE sci-fi city image credits – Tim Holleyman, Shahin Toosi, Tilman Paulin, Scott Pritchard, George Zwier, Stephen Bennett.

DID YOU KNOW? *The Lion King* **spin-off,** ***The Lion Guard: Return Of The Roar,*** **will premiere in November on the Disney Channel**

Stargate Studios

We speak to Stargate about The Walking Dead and its heavy reliance on V-Ray in its pipeline

Description Stargate Studios provides visual effects content for TV series including *The Walking Dead*, *Grey's Anatomy*, *Heroes* and *Haven*. The company has ten offices, with four in the USA and others overseas. The studio runs Stargate Malta from where it produces VFX for Spanish TV series *El Principe* and Stargate Middle East from where it produces digital effects for TV series *The Palace*.

Website stargatestudios.net

Project title *The Walking Dead* – Stargate Studios has brought zombies to life, created digital gore, enhanced live action location environments, built virtual backlots and rendered countless details to make the horror and jeopardy as believable as possible.

Country USA

Client AMC/Fox TV UK

Software used V-Ray, Maya, LightWave, FumeFX, FractureFX, Golaem Crowd, After Effects, Photoshop, Mudbox, RealFlow, PFMatchit, PF Track, boujou, mocha Pro, Google Chrome, Google Hangouts, VOS, Trapcode, Colorista, Frischluft Lenscare, Primatte Keyer, KEYLIGHT, Key Correct Pro

Contributors Sam Nicholson, owner and CEO; Suzanne Powell, digital supervisor; Sean Thigpen, compositor; Franco Leng, lead artist; Mike Cook, 3D technical director; Dylan Velasquez, compositor; Adam Ealovega, VP of technology

Portfolio Highlights
Stargate's work ranges from movies and commercials to TV
2013 *Mob City*
2011-2015 *Revenge*
2010-current *Haven*
2010-2013 *Spartacus*

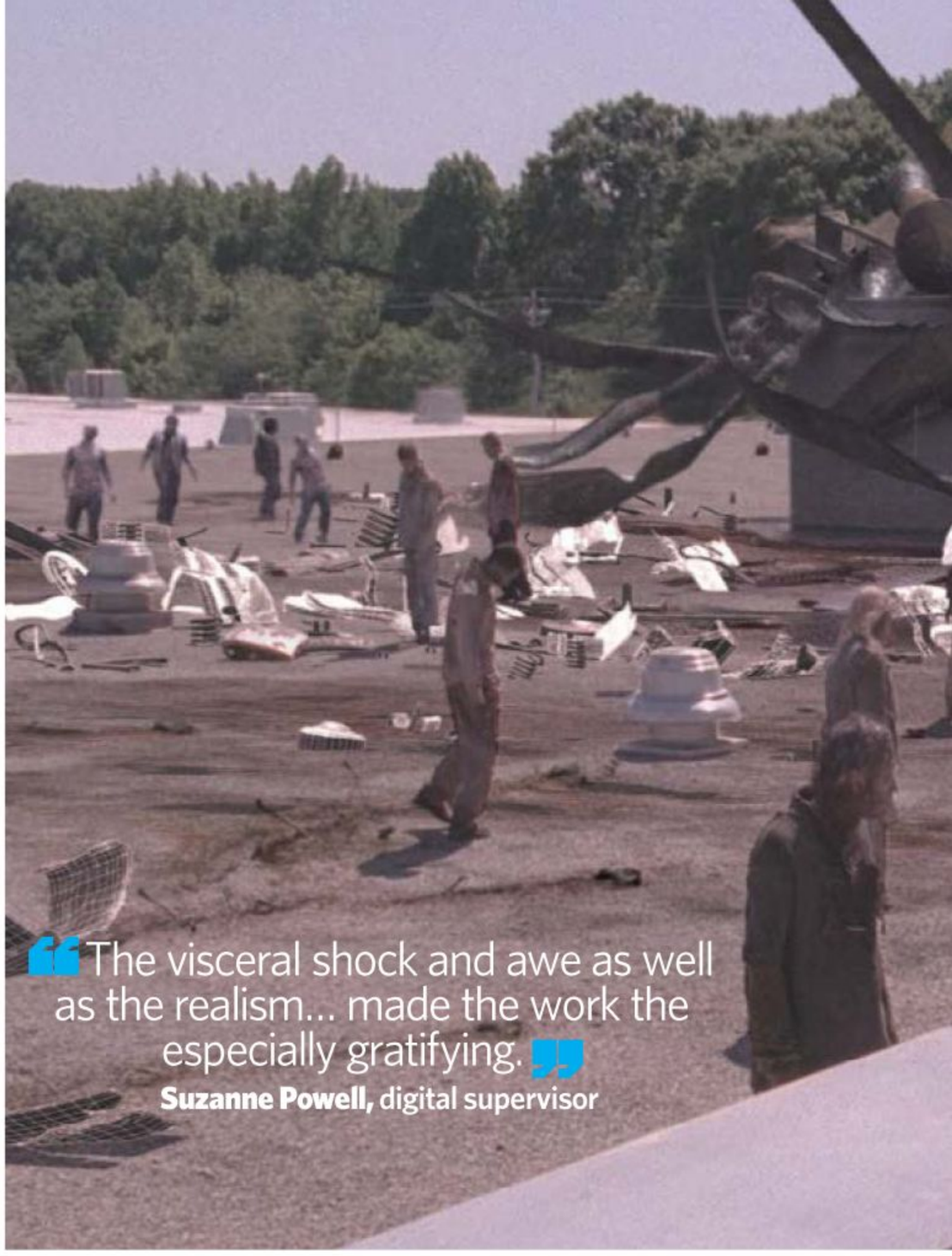
The Walking Dead images © AMC. All Rights Reserved.

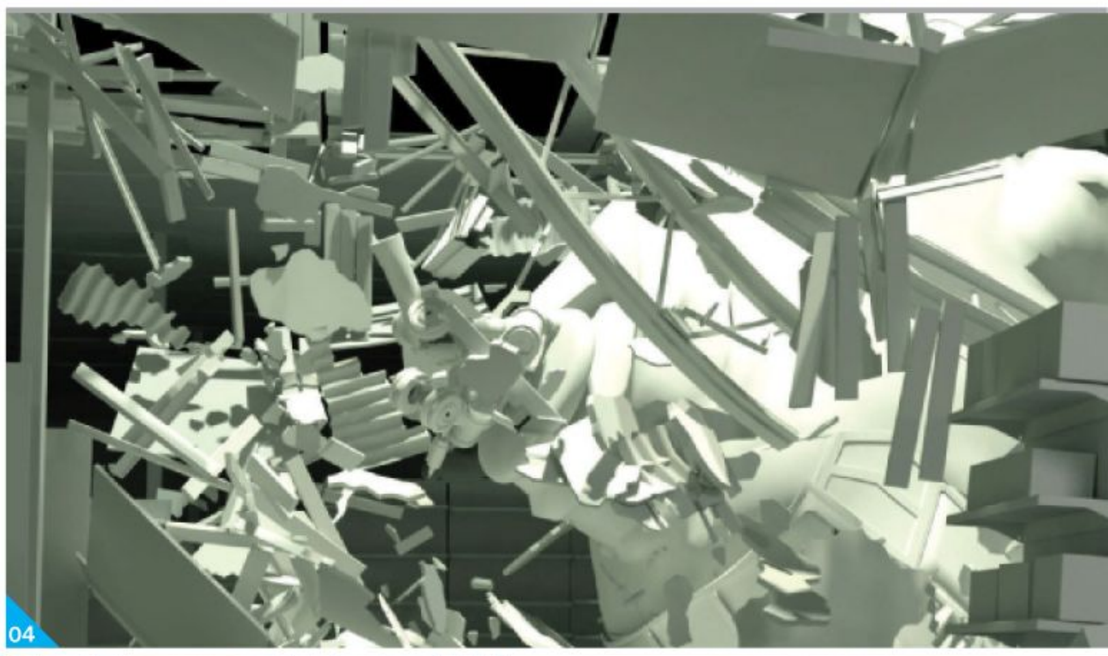
Be honed to make it convincing."

Managing resources in the fast-moving, quick-turnaround world of television production is key explains lead artist Franco Leng: "Being an episodic TV show you have to be smart about how you approach the shot. You have to look big picture and work the shot in a way that isn't just looking awesome, but can also be tweaked quickly to accommodate client notes." Compositor Sean Thigpen adds that an aesthetic constant is needed for looking at a real reference. "But don't get too locked to that," he advises, "It's always the starting point, but from there, you just need to make it look cool." With compositor Dylan Velasquez adding, "Knowing your deadlines, evaluating shots on timing, and complexity and detail helps a lot."

In order to run studios spanning three continents, resource management and industry-standard tools is key as Adam Ealovega, VP of technology, explains: "Stargate has more than ten physical offices internationally; four in North America alone, with a proprietary pipeline system developed in-house over the last 20 years. This system helps make the physical location of the artist or office relatively agnostic and allows fairly transparent and highly automated distribution of compute tasks among our global infrastructure... We use a broad range of tools including After Effects, Maya, V-Ray, LightWave, PFTrack and more. The strengths come from the high level of automation and integration of these packages into our proprietary pipeline tools, keeping artists focused on their art."

Reflecting on Stargate Studios' evolution and success Sam Nicholson, the owner and CEO, comments that: "I created Stargate to act as my own personal 'digital darkroom' where talented artists could congregate and creativity could flourish 24/7. I am most proud of the continued long-term relationships with producers, directors and the studios. The mark of any successful business relationship is how well it fares the test of time. So when any of our projects have a successful five to ten-year run, we all win. "


"The visceral shock and awe as well as the realism... made the work the especially gratifying."
Suzanne Powell, digital supervisor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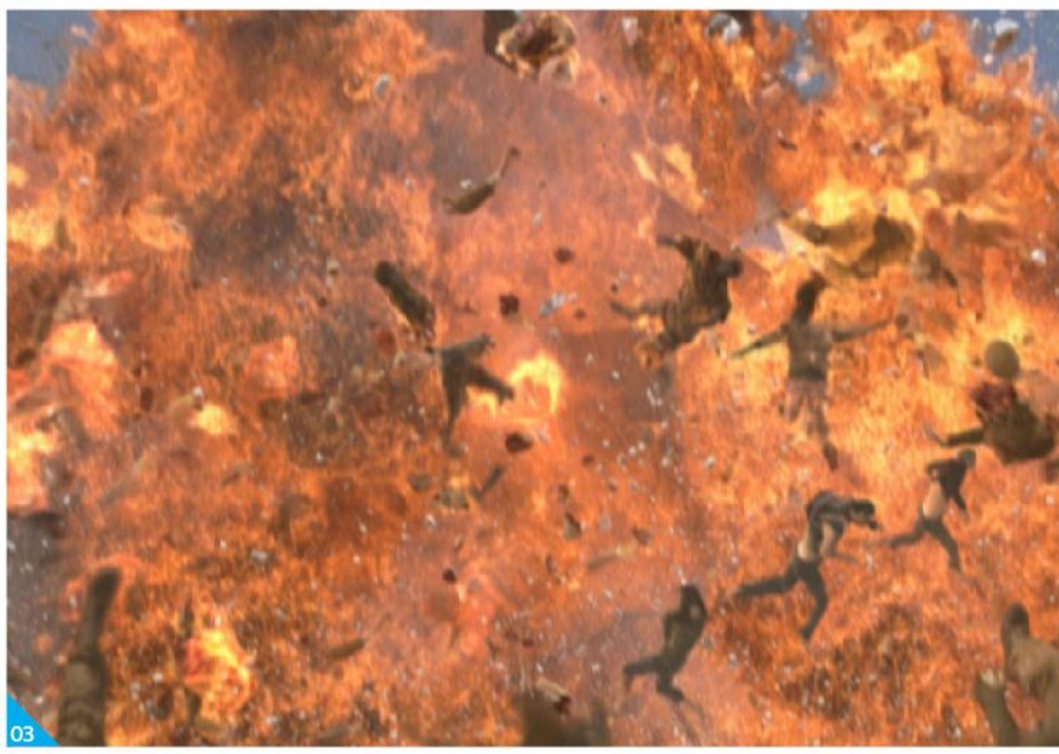


01 The placement of digital zombies and digitally rendered debris, alongside performers filmed on location, round out this shot

02 With the live action explosion as a background, bodies are composited into the inferno

03 Live action footage shot on location is enhanced with additonal zombies and smoke and fire elements

04 Environments are built and then composited with live action footage of the actors shot against green screen

05 Less obvious VFX work on *The Walking Dead* typically involves wire removal for scenes in which stuntwork features

06 Zombie hordes are digitally composited by Stargate into live action footage

07 In this comparison the live action plate photography shows a pristine forest environment. Stargate revises the material to show destroyed trees and zombies hanging from branches

Readers' Gallery

Share your work, view others' and chat to other artists, all on our website
Register with us today at **www.3dartistonline.com**

01

Images of the month

These are the 3D projects that have been awarded 'Image of the week' on 3DArtistOnline.com in the last month

01 Tourou Nagashi
by Freddy Kurnia
3DA username **Freddy Kurnia**
Freddy says: "This work was inspired by an event in Japan that I experienced recently. I really enjoyed creating this CG work. Rendered in Maya with V-Ray."
We say: *Freddy's image is simply beautiful and combines decent fluids, hard surfaces and a great use of an HDRI to achieve a fantastic overall scene. The lighting and reflections in the water are fantastic, too.*

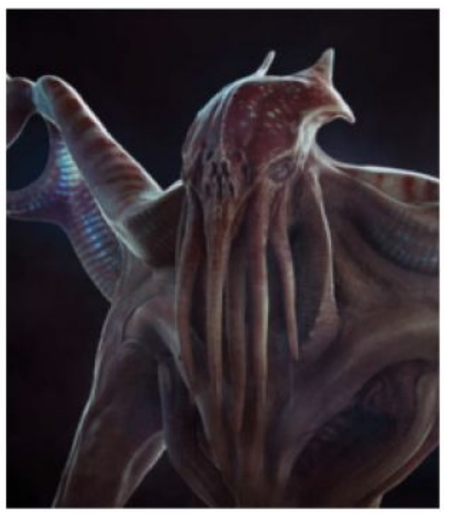
02 Exoskeleton
by Kai Kyoungsoo Kim
3DA username **backgama**
Kai says: "This is my personal work that was inspired by the film *Elysium*. I did the modelling, texturing, lighting, and rendering, and I used ZBrush, Maya, MARI, Marvelous Designer and V-Ray."
We say: *This scene is stunning – you can create a tangible sense of mystery by placing your camera behind a character, especially when they're sporting an exoskeleton this detailed!*

03 Flintlock Pistols
by André de Souza
3DA username **decosouza**
André says: "This is a reproduction of the Flintlock pistols used by George Washington in the revolutionary war. The model is part of a bigger project commissioned by RPmodels."
We say: *Another lovely example of lighting here, and André's hard surface modelling skills are impressive to boot. The composition of this image is what really lifts it, though.*

04 Red Cobra
by Ruben André Lorås
3DA username **rubenstube**
Ruben says: "A personal exercise to freshen my lighting and rendering skills. A proper nostalgic, yet modern tribute to a car without expiration date."
We say: *We love the bright, bold colours and how much attention to detail has been paid here. Ruben has done really well with his reflections too – it feels like you're looking at the car in a showroom.*

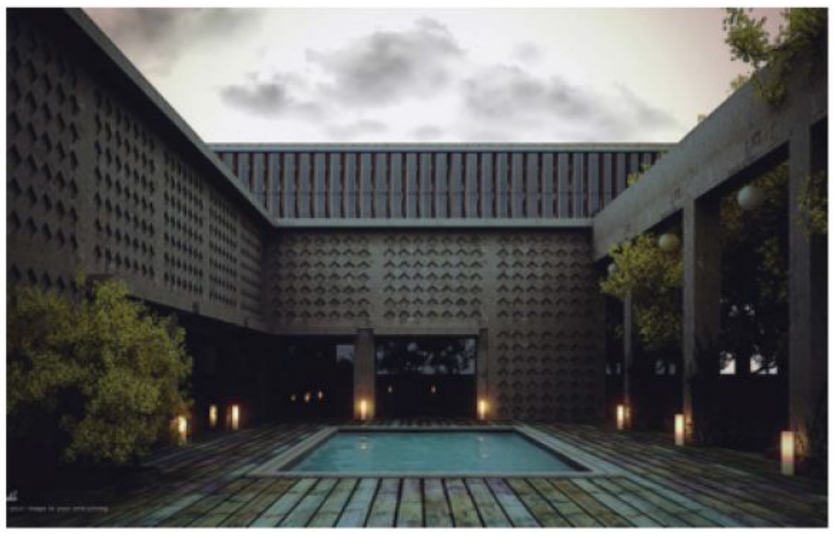
03

Image of the month



Nautilus
by Aram Hakze
3DA username aramhakze
Aram says: "I felt incredibly inspired by HP Lovecraft's descriptions of horror and wanted to create something alien and ambiguous in design. Software I used was ZBrush, KeyShot and Photoshop."
We say: *You can't beat a decent reimagining of Lovecraftian creatures – they look evil but melancholic at the same time. We think that Aram has sculpted this beast really well.*

Design Workshop **by Nikolay Boltikov**
3DA username Bowt23 Boltikov
Nikolay says: "I like to make quick, quality work with a lot of detail. I think it is possible to combine. I used 3ds Max and Photoshop to create this image."
We say: *We wish our offices looked like this! Perspective is half the battle when putting together a scene like this, but Nikolay has passed with flying colours.*



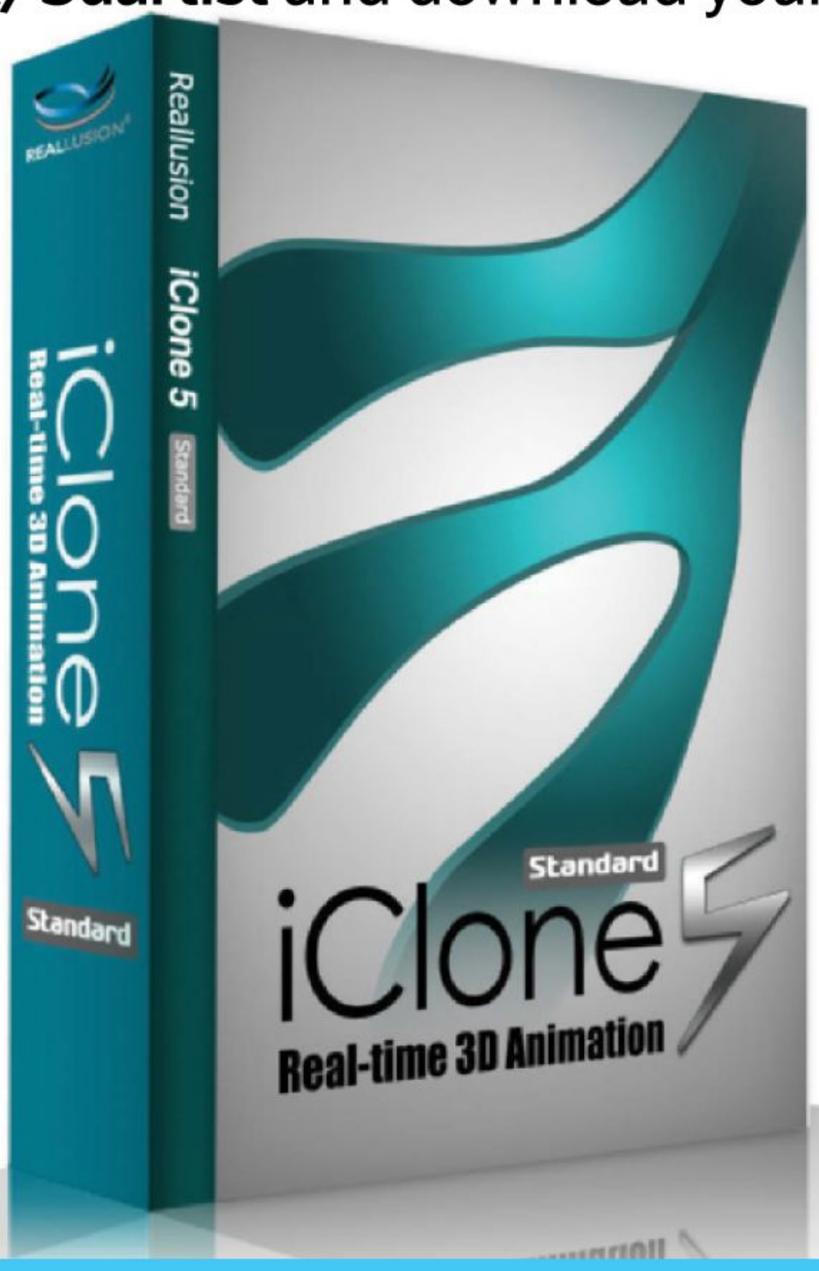
The Yard **by Mohsen Hajizadeh**
3DA username Deeters
Mohsen says: "This render was done for a V-Ray tutorial group competition. I tried to give a natural lighting look and create a nice feeling in the render."
We say: *This is quite a barren, sorrowful render, but the blue of the swimming pool really catches your eye. We love the granular quality of the building.*

The Worm
by Jon Botros
3DA username jonb84
Jon says: "A character sculpted and painted in ZBrush, then rendered with V-Ray. I've tried to make him look like an undiscovered species living in the forest!"
We say: *A lot of imagination has gone into creating this image, which is exactly what you will need when you're developing fantasy creatures. The use of colours is fantastic here, and so is the smoke effect.*

YOUR FREE RESOURCES

Log in to **filesilo.co.uk/3dartist** and download your 3D resources **NOW!**

EVERYTHING YOU NEED TO FOLLOW ALONG WITH THE MAGAZINE AND CREATE GREAT 3D ART



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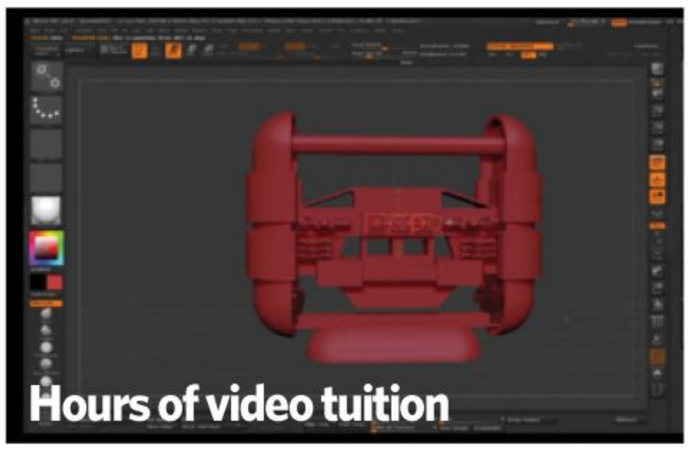

THIS MONTH'S COMBINED RESOURCE SIZE: 6GB

YOUR BONUS RESOURCES

ON FILESILO THIS ISSUE, FREE AND EXCLUSIVE FOR 3D ARTIST READERS, YOU'LL FIND 6GB OF RESOURCES, INCLUDING...

- Free download of iClone 5 Standard from Reallusion – **available until 30 Sept 2015**
- Hours of quality video tuition
- 25 awesome textures from 3DTotal for you to use in your work
- Premium 3D models courtesy of CGAxis
- A huge selection of images, videos and files from our tutorials

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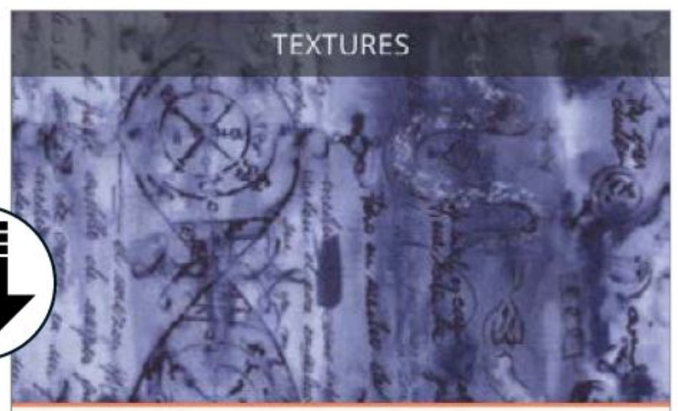
Render a cyberpunk character

Included here are supporting files and images for Damon Woods' cyberpunk tutorial...

Create comic book style renders

Hit download to get your hands on supporting images for Stefano Tsai's...



3DTotal textures

As usual, hit the download button for 25 awesome texture maps courtesy...

NEED HELP WITH THE TUTORIALS?

Having trouble with any of the techniques in this issue's tutorials? Don't know how to make the best use of your free resources? Want to have your work critiqued by those in the know? Then why not visit the **3D Artist** Facebook page for all your questions, concerns and qualms? There is a friendly community of fellow 3D artists to help you out, as well as regular posts and updates from the magazine team. Like us today and start chatting!

facebook.com/3DArtistMagazine

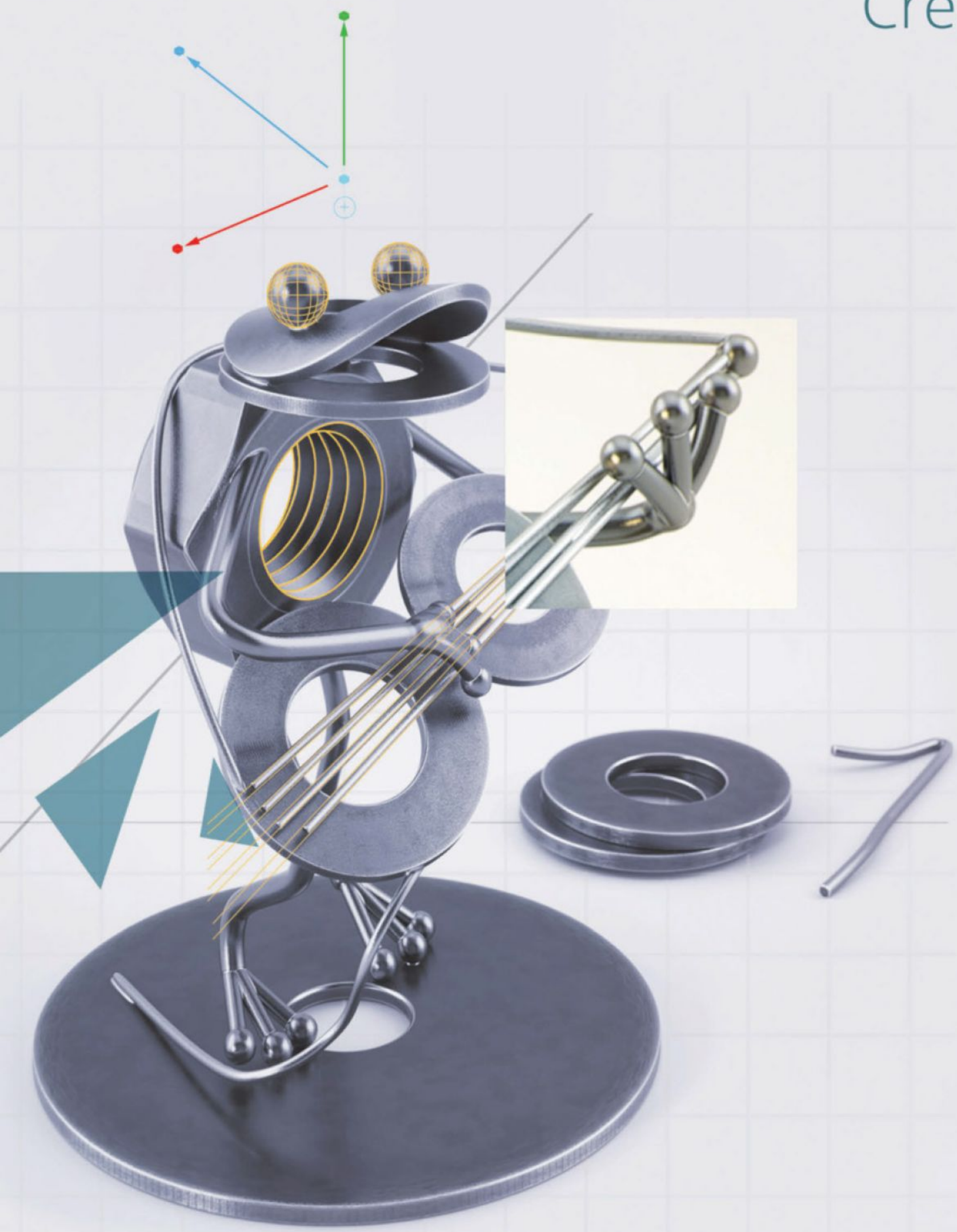
Issue 86 of **3D Artist** is on sale **07 October 2015** from **GreatDigitalMags.com**

THE FOUNDRY.

Image courtesy of Tomáš Sciskala

MODO® 901

Create Something.



www.thefoundry.co.uk

Student Duncan Key
MADE THIS IN WEEK 10!

Concept Designer
Grant Gosler

We're not sure which is cooler, the fact that Duncan made this in the 10th week of DAVE School (with no prior training) or the fact that this was the second ZBrush project assigned to his class! Our students benefit from being assigned carefully planned projects with expert instruction so they are doing amazing work right out of the gate!

They are provided with world-class designs from notable concept artists and shown professional techniques, but how they use their newly acquired skills is entirely up to them. The DAVE School never provides step-by-step instruction, we push the student to find their own way through a challenge, just like they will when they go to work at a studio.

And while we are proud of Duncan, he's by no means the only one. Check out our student galleries and you will see page after page of consistently great work from a wide variety of students! Our modeling program is common to both our 12-month **VFX Production** program and our 15-month course in **Game Production.**

DAVE SCHOOL

The Digital Animation & Visual Effects School

www.DaveSchool.com

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